

Nolato Magasin

No 32 | November 2021



RÖTT KRÖN
listen in color

Trees, wind and sun cut CO₂
Strong presence on three continents
TIM solves hot topic
Ingenious multi-function container

Smart solution for respirators

Innovative, smart solutions not only overcame technical challenges, but also saved the client money.



Find out more on pages 6-7

Wind power in China slashes CO₂ emissions

Nolato is cutting its total CO₂ emissions by more than 30% by buying electricity in China generated from wind power instead of coal.



Find out more on pages 8-9

Innovation through rigorous approach

Making a real difference using functional solutions was the aim in developing a new hydrophilic catheter for women.



Find out more on pages 12-13

Thermal management poses challenges

The electronics industry faces significant challenges managing the heat generated by electronics, particularly in electric vehicles.



Find out more on pages 16-17



Image above: Norbert Meleg shows a group of school children round the facility in Mosonmagyaróvár, Hungary. Being a good corporate citizen is so important for Nolato that it's one of the key elements of our code of conduct.
Cover image: Rött KRÖN showcases Nolato's customer offering in consumer electronics.



This magazine is produced for our customers, shareholders and employees, and anyone else with an interest in the Group.
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Nolato has established a solid global position on the three key markets of Europe, North America and Asia.

Nolato's strategic transformation

A global partner with development, production and customers on three continents

Nolato has developed significantly over the past decade and is now a global group, in which all three business areas have a strong presence on three continents and a wide array of successful global companies as customers. Although the foundations for this were laid over 80 years ago, it was a strategic decision around 10 years ago that was key to the evolution that has led to the Nolato we know today.

"We realized that the traditional subcontractor role of being good at manufacturing components to customer specifications wasn't enough for us to develop further," explains Christer Wahlquist, who was a business area president at the time and is now Group President.

"The suppliers of the future need to be able

to offer customers everything from concept discussions and development support to delivery of the final product. They also need to be able to offer local production worldwide to support customers as they develop."

Transformative decision

"We felt that suppliers who were unable to offer this could be eliminated, and we didn't want to be one of them," adds Christer. "So we decided to take Nolato to the next level and turn it into a global, high-tech, advanced partner for our customers."

Anyone who runs a company knows it's one thing to take that kind of decision, but quite another to put it into practice. So how has Nolato succeeded in transforming itself from a decent regional component supplier

into a global partner that supplies end-to-end solutions; a solutions provider with development, production and customers on three continents?

"I believe the key factor has been that from the outset we already had a lot of the core capabilities for this type of strategic transformation," explains Christer. "For instance, we'd long had a strong corporate culture that's based on capable individuals working together, with expertise, good ideas and a sense of responsibility, which creates a successful company. This has led to us having a collaborative structure and a clear philosophy that decisions should be taken close to those people affected by the decisions.

"That means management teams at our development and production units around



the world have significant scope to lead their units in a way that fosters an entrepreneurial spirit and taking the initiative. The role of Group management is to set targets, ensure that the pace and direction are right and to provide support if necessary. But how those targets are achieved in practice is determined by local management.”

Valuable continuity

Christer Wahlquist believes this strong corporate culture, with significant influence at all levels, has created another key factor: continuity. The turnover of employees at Nolato’s units around the world is very low, both on the shop floor and among management.



Christer Wahlquist
President & CEO

“The in-depth knowledge and experience this creates, not just about Nolato but also about our customers and markets, make it easier for

us to navigate as the world changes. Nolato comprises so much experience that allows us to be proactive even when the road gets difficult or we face obstacles,” says Christer. “It gives us the ability to continually evaluate

business opportunities and quickly adapt to new circumstances.” In addition, Nolato has strong individual owners.

“As well as acting as a sounding board, the support that active long-term owners provide is priceless,” notes Christer. “If you’re out on the open sea and the wind isn’t blowing in the right direction, it’s good to have owner representatives on the Board who have seen it all before and know you have to have a firm hand on the tiller.”

Already pointing in the right direction

“And this is where the fourth core success factor comes in: We were already good at what we did. We were already sailing in the right direction, had the wind in our sails, with practiced hands on the tiller and a chart to follow. We have also made a number of strategic acquisitions that have boosted our capabilities and strengthened our global presence.

“And we’ve always had a good financial position, which is perhaps the final core factor. This has enabled us to continually invest in acquisitions, technology and skills to further develop our customer offering.”

So what does today’s Nolato look like?

“We have achieved much of what we wanted to when we embarked on this transformational journey,” says Christer. “We have

become a strategic partner for many of our customers and we have both the resources and expertise to support them from concept to the delivery of finished products. We have more than 35 of our own development and production units in Europe, North America and Asia, which are expanding continually to meet customer needs.”

Working closely with customers

Nolato’s business concept is based on close cooperation with large, leading, globally successful companies with exacting standards on precision, quality and security of supply.

“We support customers by being experts in product development and large-scale manufacturing of complex plastic products,” notes Christer. “For example, we can meet customers’ requirements to integrate electronics into their products, which is highly sought after these days, and help them cut their carbon footprint by designing products with recycling in mind and, where possible, using recycled or bio-based plastic materials in manufacturing.”

Selected customers

“Our philosophy is to work with selected customers, not with selected industries. This means that all our customers benefit from the cross-fertilization that happens when



we solve and are influenced by challenges in other sectors.”

The journey continues

“And although we are highly decentralized, our business areas and group companies are not isolated; they work together as one Nolato,” notes Christer. “This ensures that all our expertise and resources are available to all customers worldwide.

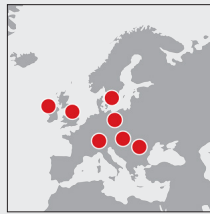
“It means, for example, that a medtech customer can benefit from our Integrated Solutions business area’s extensive experience of integrating electronics into products, while the rest of the work is handled by medtech specialists in Medical Solutions.”

Nolato’s global presence

But Nolato’s transformation isn’t over.

“Far from it! We’re continuing to invest in people, advanced development techniques, efficient production and additional acquisitions, as well as building on our strong corporate culture, in which people make a difference by working closely with others who want to make a difference,” concludes Christer Wahlquist. “There are always new journeys ahead to learn even more and constantly progress.”

Nolato’s global presence



Europe

Ireland

Avenue, Sligo ■

Poland

Nolato Stargard, Stargard ■

Romania

Nolato Romania, Negoesti ■

Switzerland

Nolato Treff, Degersheim ■ ■

Sweden

Nolato AB, Group HQ, Torekov

Nolato Cerbo, Trollhättan ■

Nolato Gota, Götene ■

Nolato Lövepac, Skånes Fagerhult ■

Nolato MediTech, Hörby ■

Nolato MediTech, Lomma ■

Nolato MediTor, Torekov ■

Nolato Plastteknik, Gothenburg ■

Nolato Polymer, Torekov ■

Nolato Polymer, Ängelholm ■

Nolato Silikonteknik, Hallsberg ■

Nolato Beijing, Kristianstad ■ (developm.)

Hungary

Nolato Hungary, Mosonmagyaróvár ■ ■

Nolato Silikonteknik, Győr ■

UK

Nolato Jaycare, Newcastle upon Tyne ■

■ Medical Solutions

■ Integrated Solutions

■ Industrial Solutions



North America

Mexico

Nolato GW Querétaro, El Marques, Querétaro ■ ■

United States

Nolato Contour, Baldwin, Wisconsin ■ ■

Nolato GW Bethel, Bethel Vermont ■

Nolato GW Royalton, Royalton, Vermont ■ ■

Nolato GW San Antonio, San Antonio, Texas ■ ■

Nolato GW Silicones, Royalton, Vermont ■ ■

Nolato GW Tucson, Tucson, Arizona ■

Nolato Jabar, Andover, New Jersey ■



Asia

China

Nolato Beijing, Beijing ■

Nolato Beijing Medical, Beijing ■

Nolato Beijing, Suzhou ■

Lövepac Converting, Beijing ■

Lövepac Converting, Shenzhen ■

Nolato Silikonteknik, Beijing ■

Nolato Silikonteknik, Suzhou ■

Nolato GW Dongguan, Guangdong ■ ■

Malaysia

Nolato Silikonteknik, Penang ■

Nolato Lövepac, Penang ■



The valve unit is on the exhalation side of Dräger’s respirators and ventilators. Its principal purpose is to sense how the patient is breathing.

Solving technical challenges and cutting costs for customers

As experts in design, materials and high-volume production, a key aspect of Nolato’s work for its customers is being part of the process of continually improving products. This might involve making changes that enhance the customer experience, make production more efficient or cut manufacturing costs. Or perhaps a combination of all three.

Nolato MediTor has been working for some time with German group Dräger on developing and manufacturing various kinds of tubing and valves for their intensive-care products and breathing apparatus, including respirators and ventilators. The partnership has worked well, which led to Dräger contacting Nolato MediTor to draw on its expertise in materials and manufacturing when they wanted to make improvements to their existing valve unit for ventilating patients.

The valve unit is on the exhalation side of the machines and its purpose is to monitor the patient’s breathing and to close the exhalation channel when the patient breathes in.

If the patient is breathing normally, the machine effectively does nothing, but if

breathing deteriorates or stops completely, the machine senses this and assists breathing by ventilating the patient to the extent required.

Plastic, TPE and silicone

The valve unit comprises nine components made by Nolato MediTor in thermoplastic, TPE and silicone for subsequent assembly on a semi-automated assembly line. The key component of the self-adjusting function is a membrane inside the valve unit that senses breathing pressure.

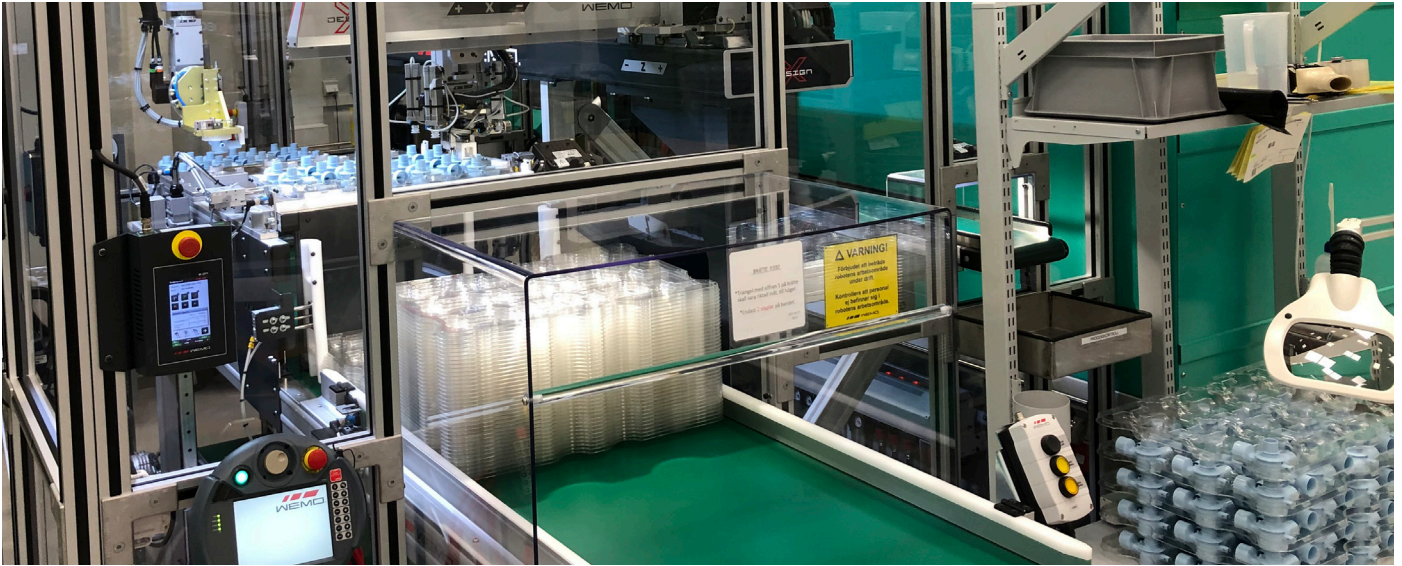
“In previous versions of the valve unit, this membrane consisted of a metal disc that was overmolded with silicone,” explains Urban Borgcrantz, project manager at Nolato MediTor. “But it wasn’t an optimal

solution, as it was quite complicated to manufacture.”

In the new valve unit, the metal membrane has been replaced by a unique injection-molded membrane made of plastic and silicone. The plastic component is formed from a hard polymer that can withstand high temperatures and has excellent dimensional stability, giving it the flatness that Dräger requires.

Complex 2K injection molding

“We make the membrane using two-component injection molding with rotating molds,” explains Rickard Bengtsson, Technical and Development Engineer at Nolato MediTor. “It’s complex because the membrane consists of three parts: the outer ring and disc



Nolato MediTor injection-molds nine components in plastic, TPE and silicone. These are assembled on a semi-automated line and undergo thorough inspection before being packaged and supplied direct to Dräger’s customers in the healthcare sector.

in the middle are plastic, while the space between these is made of silicone. If it’s not completely sealed the silicone leaks out and forms flash on the product.

“There was a lot of trial and error, but we had plenty of help from Nolato Medical’s Technical Design Center, TDC, in Hörby for analyses and simulations.”

In-line surface treatment in the mold
The plastic is surface-treated inside the mold to help it bond with the silicone. This is done using a robot, which goes into the mold before it closes and the silicone is molded over.

“It’s not unheard of to surface-treat plas-

tic prior to further processing,” says Rickard Bengtsson. “But what’s unusual here is doing it using a robot that goes into the mold and treats the plastic in-line.”

Other parts of the valve unit have also been simplified and improved. For example, a fine mesh in one of the valve’s tubes used to require two-component injection molding, but the new valve has just one TPE component that is injection-molded in a single stage.

Once the nine components have been assembled, each valve unit is inspected thoroughly to ensure it functions according to all of Dräger’s requirements.

“We also fit the valve unit with an antenna

and RFID label, which contains digitally readable information confirming that it has passed the comprehensive inspections.”

They are then individually packaged and sent direct to end users at hospitals.

Overcoming challenges

“We’re delighted with this project,” says Johan Barkentin, Sales and Project Manager at Nolato MediTor. “Not only have we successfully resolved the technical challenges for the customer, we’ve also saved Dräger money by adopting an innovative and smart approach.”



Glenn Svedberg is Nolato's new Head of Sustainability

Nolato's new Head of Sustainability: Significant customer interest in switching to lower-carbon materials

Sustainable development is one of the most important aspects of running a business today. It's about continually reducing the company's negative impact on people and the environment, or simply taking on our share of responsibility. Not just today and tomorrow, but every day that follows.

Sustainable development has long been an important area for Nolato, both in our day-to-day operations and our long-term, strategic planning.

"We now have a very clear sense of our business' impact on people and the environment," says Nolato's President and CEO, Christer Wahlquist. "We've been making sure we take responsibility for many years, not just in terms of environmental impact but also in relation to social, ethical and economic aspects.

"Sustainability has long been integral to our way of running the business, both in the short and long term. We always consider environmental factors in our day-to-day production operations and in discussions with customers."

Environmental impact is also a key ele-

ment of discussions and decision-making in the Board's long-term work. Nolato's Board has therefore appointed a Board member with special responsibility for monitoring the Group's sustainable-development efforts and maintaining close contact with management on these matters.

New Head of Sustainability

Nolato's new Head of Sustainability, Glenn Svedberg, recently joined Group management to ensure sustainability issues are always specifically integrated into the Group's business operations.

"The climate threat is now our biggest challenge, which is why it's a priority for us," explains Glenn Svedberg. "We will of course continue to review our own impact from processes and energy usage. But the great-

est benefit we can contribute is to support our customers in opting more for recycled or renewable plastic raw material in their products.

"So we work with raw material suppliers and are actively involved in evaluating the low-carbon materials that are being developed. Testing, trying out and ensuring commercial availability of these raw materials allows us to provide our customers with specific business proposals and an opportunity to consider the sustainability aspects," says Glenn.

"Our customers are very keen to be part of this change. The threshold is slightly greater in highly regulated segments such as medical technology, but we are beginning to see opportunities in these areas too."

A few key questions for the new Head of Sustainability

What are the principal areas for Nolato?

The climate threat represents a major challenge for the whole of society and is high on our agenda. The environmental impact of the use of plastics is also a priority area. Other significant issues concern creating conditions for a safe and stimulating work environment, and ensuring we apply sound business ethics.

What are Nolato's environmental targets?

It's over 10 years since we established our first sustainability targets, and we've raised the bar considerably ever since. Our targets cover everything from the environment to business ethics, and seven of them are linked to the UN's Agenda 2030 and sustainable development goals.

What about carbon emissions?

Under our emissions target, Nolato aims to achieve an 80% cut in its carbon dioxide emissions from energy usage by 2025. We've been measuring our emissions for the past 12 years, so we have a strong baseline to enable comparisons with 2011/2012. We've made considerable progress so far through energy efficiency improvements and by phasing out fossil fuels and buying fossil-free electricity. We need to do more to hit the target by 2025 and one important step is the purchase of renewable electricity in China, which began this year. Similar programs will be introduced in the US.

Nolato has joined a number of global initiatives and adopted standards. Why?

Many years ago, Nolato decided to certify its production units to the ISO 14001 environmental management standard. Certification is good for our environmental efforts and is now much in demand from customers. The Group is a signatory to the UN Global Compact, a global sustainable-development network. We also adhere to international standards and guidelines on sustainability and financial reporting. All of this bolsters Nolato's sustainability work and supports communication with our stakeholders.

Want to find out more about Nolato's sustainability work? Visit [nolato.com/sustainability](https://www.nolato.com/sustainability)



Shrinking our carbon footprint by switching from coal- to wind-generated power in China

Nolato is cutting its global carbon emissions by purchasing renewable electricity in China, taking an important step towards the target of reducing its carbon footprint by 80% by 2025.

Nolato has introduced a number of sustainability initiatives at its production plants in China over the years. Reducing the impact on the climate is a vital issue for society, and Nolato is now implementing robust measures to cut its carbon footprint in China.

Nolato has considerable production in China, with a number of large production facilities and over 3,500 employees.

"We've been endeavoring for some time to use energy as efficiently as possible, to cut waste and minimize water consumption. All of this helps reduce our carbon footprint, but until now we've depended on purchasing electricity mainly generated by coal-fired power stations," says Thomas Hofflander, Managing Director of Nolato Beijing.

"Switching to buying electricity generated from wind power instead of coal will cut carbon emissions in China by around 75% and reduce the Group's overall carbon footprint by more than 30%".



Nolato purchases electricity from new solar farm in southern Sweden

As a further step towards sustainable operations, Nolato has signed a power purchase agreement (PPA) for a solar farm scheduled for completion in spring 2022.

The solar farm will be constructed over an area larger than 11 football pitches. It will have an installed capacity of around 8 MW and average annual generation of 8 GWh.

That's the equivalent of powering 1,600 houses for a year and will supply around 15 percent of Nolato's electricity in Sweden.

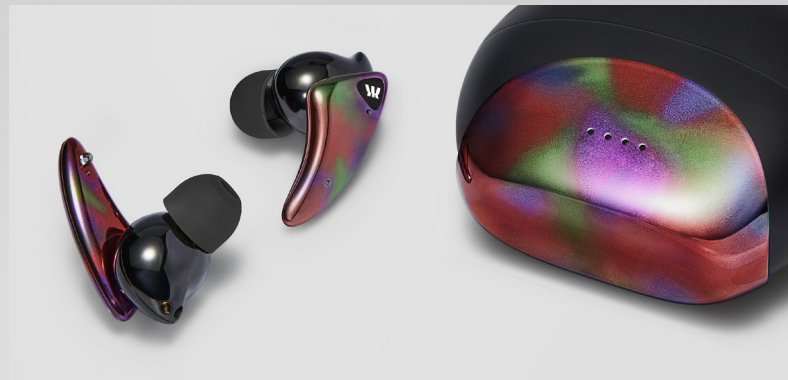
The agreement, which runs for 10 years, will help the Group to further reduce its environmental impact, while cutting electricity costs and shielding it from electricity market volatility.

RÖtt KRÖN earphones

Reality meets fantasy

RÖtt KRÖN is a new brand of wearables – consumer electronics that are not only high quality but also high fashion. Above all, the brand showcases Nolato's customer offering in consumer electronics.





The latest, in fact their first and only, product is a line of wireless earbuds. They sound great, with bright treble and deep bass that put you at the heart of the music. But they also look amazing. A far cry from bland white or black.

🔗 When you stand out but you're definitely in. That's Rött Krön.

🔗 Wireless earbuds that look like jewelry. That's RÖTT KRÖN.

🔗 Tough bling inspired by Swedish Vikings that lets you bask in your favorite beats. That's Rött Krön.

🔗 Stepping out and rocking out in style. That's Rött Krön.

Hang on, Nolato Magasin doesn't usually run ads for consumer goods! We're a serious magazine talking about serious matters at Nolato.

Well, that's just what this article is about. "There are a lot of products that have the potential to be more interesting," says Dan Wong, Managing Director of Lövepac Converting, one of Nolato's companies in Asia involved in consumer electronics. "Most are white, black or gray. Some mobiles have a little color on the back. Beautifully made,

high-quality, sleek surfaces. But none of them really stand out.

"So when the pandemic hit and changed things for companies, we had a think and decided to make something that shows what's possible.

"To stand out. To be different from the rest. To make a difference. Just as our customers aim to do."

RÖTT KRÖN

The result was Rött Krön. A line of in-ear headphones. But Nolato's earbuds are different from regular products on the market. They stand out from the crowd by using different materials and colors. An approach that breaks the mold. And stylish cases that also charge the earbuds.

"OK, so this technology is already available on the market," admits Dan. "But ours aren't white. They have exciting colors and shapes. Jewelry made from one of the hardest materials known, zirconium, sintered at 1,500 degrees and virtually unscratchable. Exceptional design that stands out and reflects your personality."

Surfaces that use all of Nolato's capabilities to make products stand out. Existing,

proven decoration technologies. In other words, reality that feels like fantasy.

Rött Krön has started selling in China. Can you explain the product name?

"We're incredibly proud of our Swedish heritage. We are a Swedish company in Asia, with Swedish roots in Torekov in southern Sweden. So, obviously, we wanted to have a Swedish name for the product, something different.

"But we shouldn't think we're going to sell our earphones to consumers on a large scale, we don't actually want to," admits Dan Wong.

Showcasing possibilities

"That's not why we're doing it. This product is simply a showcase for the possibilities that Nolato offers customers. From ceramics to plastic, from mechanical to cosmetic options, and from molds to integrated electronics. We want to inspire our current and future consumer electronics customers to think a little outside the box. And to use the capabilities that exist to stand out from the crowd. To be different from the rest.

"Just as we're trying to do now, to show our customers what's possible."



The objective was to create a hygienic, easy-to-use, convenient hydrophilic catheter for women.

Uncompromising approach produces innovative catheter

Gothenburg-based Wellspect wanted to make a real difference by developing a new hydrophilic intermittent catheter for women who need help emptying their bladders.

Not everyone is able to empty their bladder when they need to. There can be a number of factors that prevent normal bladder-emptying, meaning that assistance is required. Intermittent self-catheterization (ISC) is a method that can provide a solution for people who have problems emptying their bladders. It involves the use of a hydrophilic catheter; a disposable product that is inserted into the urethra and empties the bladder.

It can be difficult talking about not having normal bladder function and many people put off seeking help. So when Wellspect started developing a new catheter for women, their aim was to make a real difference

by offering a hygienic, easy-to-use and convenient hydrophilic intermittent catheter in a discreet container.

Container doubles as a handle

The result was a catheter with a container that has a number of functions. Not only does it store the lubricant that keeps the catheter moist, but it also connects to the catheter to form an L-shaped handle, making it easier to insert the catheter into the urethra.

The ergonomic L-shaped handle allows women to sit in a more upright position, provides better reach and greater control during catheterization and bladder-emptying. The

handle also provides a non-touch technique, preventing the user from getting urine on their hands and making catheterization more hygienic.

The catheter can be put back in the resealable container after use and then placed in a purse and disposed of later on. The outer packaging is made from recyclable material for maximum sustainability.

Interesting challenge

"We've been making catheters for Wellspect for some time," explains Jens Ingemansson, Sales and Project Engineer at Nolato Med-Tor in Torekov, Sweden. "When Wellspect

got in touch and told us about their ideas for this new product, it presented an interesting challenge.

“Our own extensive experience and in-depth knowledge of soft materials were a good match with this project for the catheter components, but we soon realized that the packaging, the container, needed completely different expertise. We knew Nolato Cerbo had these capabilities, as they’re experts in manufacturing pharmaceutical packaging to stringent requirements on sealing and function.”

A key challenge of this project was for the different parts of the container to be completely sealed, retaining the catheter’s lubricant and ensuring the product is ready to use, and that there is no risk of urine leaking out after use. To minimize the risk of compli-

cations for the user, the outer packaging also has to be completely sealed to guarantee the product is sterile. So the cap is designed to indicate to the user that it has not been opened previously.

Close collaboration

“Wellspect and Nolato have worked very closely on this,” says Anci Petersson, Sales and Marketing Director at Nolato Cerbo. “The customer provided a design and the functional requirements, which we then helped refine and adapt so that the product meets all the requirements, while also enabling efficient high-volume production.”

Much of the work therefore focused on getting the correct seal between the catheter and the container, and between the different parts of the container. The product

also had to be easy to use, including for someone with impaired hand function. So the packaging was devised with a waveform design, allowing the user to twist the components apart instead of having to pull them apart. This was an aspect that required a lot of work to ensure it was sealed yet easy to open.

Exactingly functionality requirements

“Our task has been to ensure all the closures are completely sealed during assembly, sterilization, shipping, all the way to the customer,” explains Jens Ingemansson. “But those surfaces that need to be completely sealed when it’s closed also need to have relatively low sliding resistance so that it isn’t too difficult for the user to access the catheter. This work required precision to a couple of hundredths of a millimeter in some cases.”

“The product’s functionality placed stringent requirements on barriers, hinges and closures,” explains Dennis Broberg, Head of Product Development at Nolato Cerbo. “We’re very familiar with these areas because of our work on pharmaceutical packaging.”

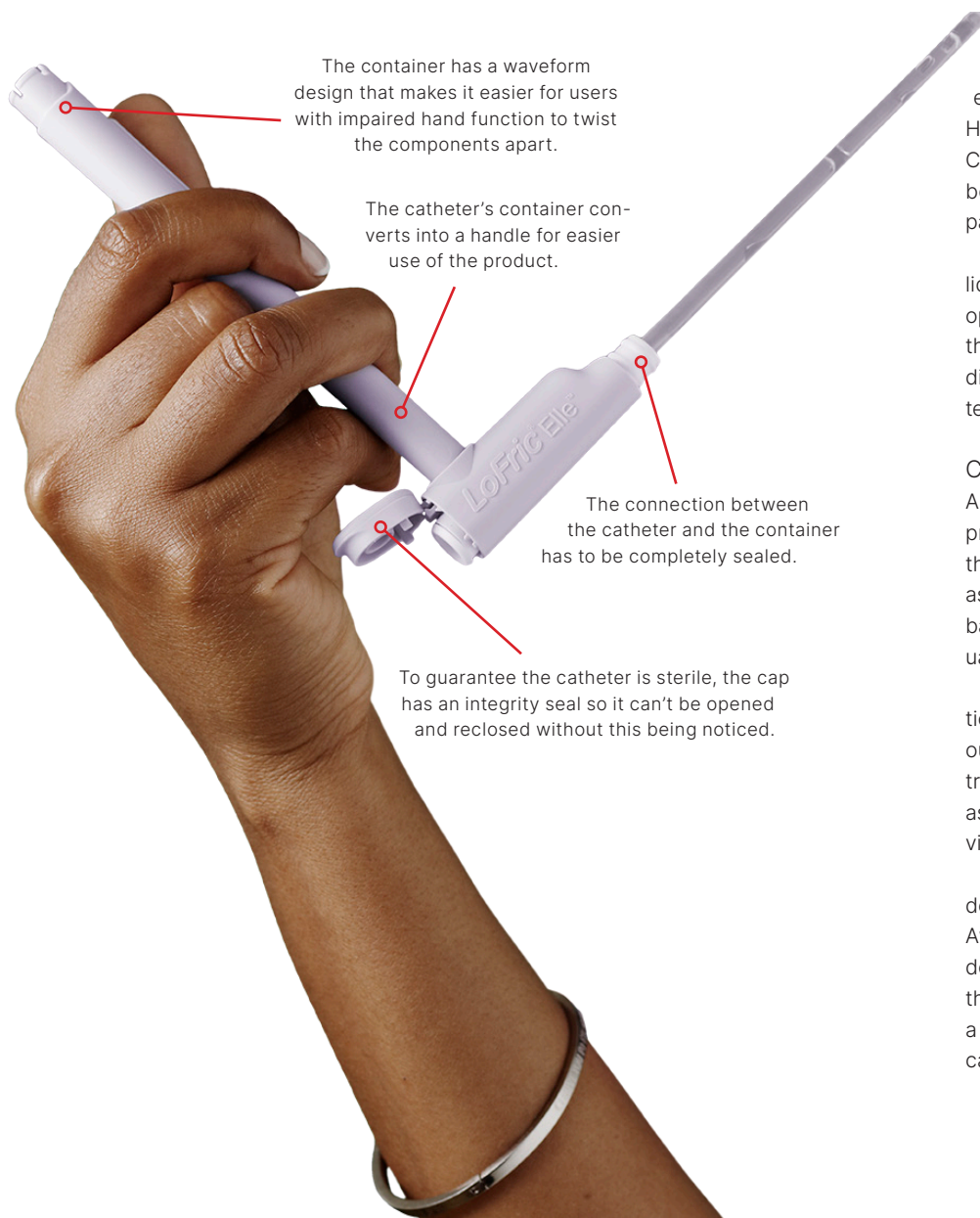
For instance, the container has a snap-in lid with an integrity seal, making it easy to open and indicating that the catheter inside the container is unused. The cap can’t be too difficult to break off, but it also has to guarantee that the product is unused.

Cooperation and flexibility

A third Nolato unit was also involved in the product. Wellspect had planned to assemble the parts in-house. But while Wellspect’s assembly line was being completed, Poland-based Nolato Stargard helped out with manual assembly.

“The significant possibilities for cooperation and flexibility offered by Nolato throughout the project, combined with us constantly trying to respond to customer needs, are key aspects of providing clients with great service and support,” adds Anci Petersson.

The catheter’s innovative function and design have garnered both an iF Design Award and a Red Dot Award for outstanding design. In 2021, the product also received the UK’s Look Good Feel Good Award from a judging panel of healthcare personnel and catheter users.

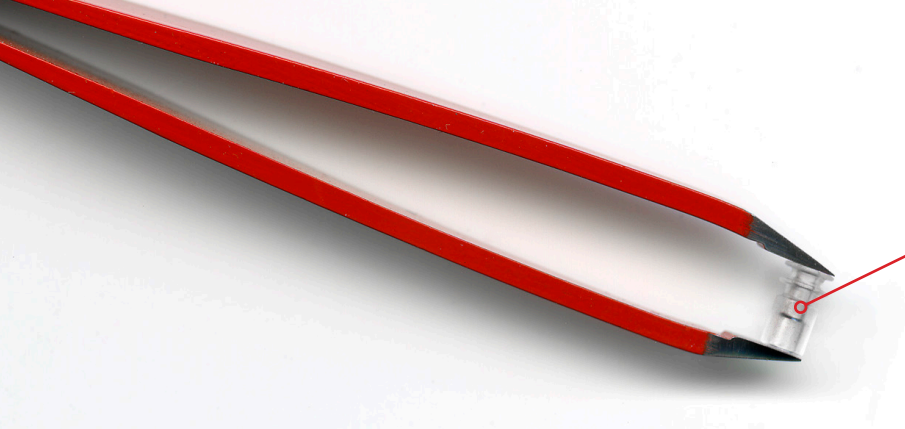


The container has a waveform design that makes it easier for users with impaired hand function to twist the components apart.

The catheter’s container converts into a handle for easier use of the product.

The connection between the catheter and the container has to be completely sealed.

To guarantee the catheter is sterile, the cap has an integrity seal so it can’t be opened and reclosed without this being noticed.



Silicone components can be injection-molded with walls as thin as 0.1 mm or as extremely small details weighing as little as 0.001 grams. Larger components can also be formed in complex shapes or together with different types of plastic.

Nolato is one of the leading global players in silicone injection molding

Nolato is one of the world's leading suppliers of injection-molded silicone products. With four development and production units in Europe and North America in its Medical Solutions business area, Nolato has significant capabilities to meet customer needs within both liquid and hard silicone.

"The acquisition of Nolato GW in the fall of 2020 provided the Nolato Group with additional medtech expertise and capacity, not only in plastics but also in the injection molding of liquid and hard silicone," explains Johan Iveberg, President of Medical Solutions.

40 years' experience

Prior to the acquisition, Nolato already had wide-ranging know-how and more than 40 years' experience in injection-molding silicone. Further progress a few years ago was made with the transfer of skills to Nolato Contour in Wisconsin in the US.

Following the integration of Nolato GW's extensive silicone business, Nolato is one of

the leading global players in silicone injection molding.

"There aren't many manufacturers in the world that can really injection-mold complex silicone products without 'flash'," explains Mark Hammond, General Manager of Nolato GW Silicones, based in Royalton, Vermont. "Our customers know it takes a unique combination of expertise, technology and resources to always achieve good results.

"We now have the opportunity to support customers that need manufacturing in various geographic regions or that are expanding production to more locations to minimize risk. We can now handle these kinds of projects entirely within the Nolato Group."

Nolato GW also has expertise and resources to produce the complex molds needed for the injection molding of liquid silicone.

Four units that injection-mold silicone

The Medical Solutions business area now has four units specializing in the injection molding of liquid and hard silicone. Nolato MediTech and Nolato MediTor in Sweden and

Nolato Contour and Nolato GW Silicones in the US. All four also provide injection molding of plastic in the same premises or nearby, allowing them to offer various combinations of silicone and plastic.

"This is something that's often requested for medical devices, with silicone frequently included as part of an assembled product," explains Kristian Larsson, Head of Sales at Nolato MediTech.

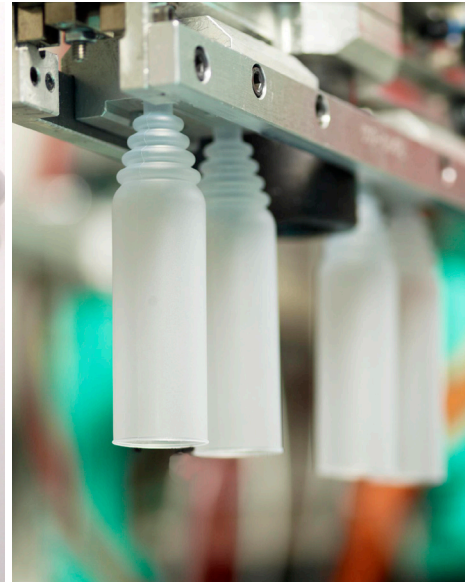
Great addition

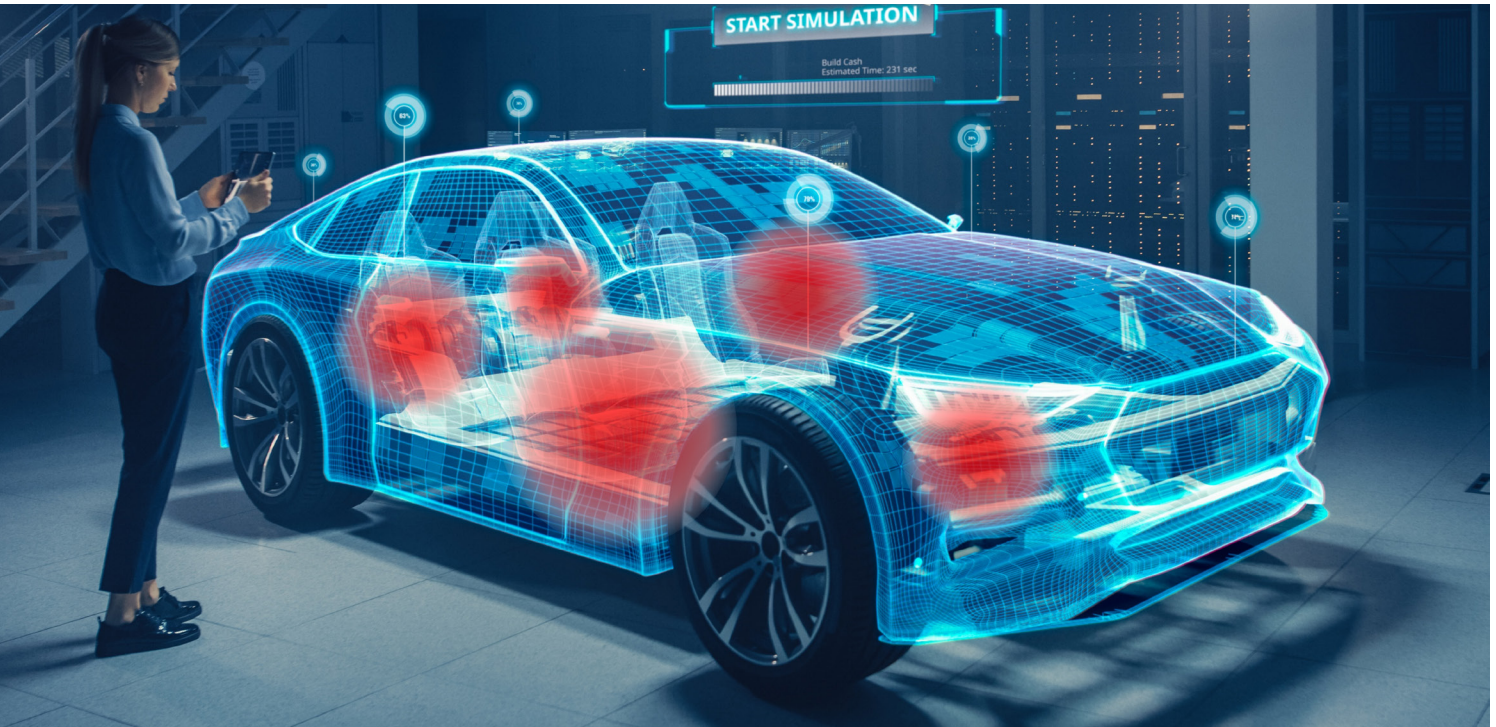
"Those of us who work with silicone in Sweden are really pleased about the addition in the US. We can make a clear distinction between the Group's different units and learn from one another. There are also good opportunities to transfer know-how to other Nolato units, should one of our customers need production where we don't currently have any."

EMC solutions

As well as medtech, Nolato also manufactures silicone seals for electronics to achieve electromagnetic compatibility (EMC). These include silicone products used by customers in sectors such as telecom, consumer electronics, automotive and aviation.







Managing the heat radiated by increasingly complex electronics is a growing issue in the automotive industry, particularly in hybrid and electric vehicles. Nolato Silikonteknik offers effective solutions in this field.

Electronics industry faces significant thermal management challenges

As electronics become increasingly powerful, the heat being radiated is escalating in terms of what current cooling technology can handle.

The entire global electronics industry faces significant challenges in thermal management. Demands are growing for higher-performing systems that can cope with more powerful software, faster data transfer rates in communications networks and internal data buses, all packaged in smaller, lighter devices. This means heat generation and, more crucially, heat density, is rapidly reaching the limits of what current thermal-management technology can handle.

For the automotive industry, these issues are compounded by the rapid evolution of vehicle electronics in general and hybrid and electric cars in particular.

Thermal issues specific to the front-end of automotive electronics include:

Vehicle safety and ADAS. Advanced driver assistance systems (ADAS) govern active responses in brake and steering systems, as well as airbags and other safety features. Increasingly advanced sensor suites monitor activity around the vehicle in real time using radar, lidar, infrared and stereoscopic sensors. These sensors and, more importantly, the amount of data and the computations performed on it, require ever more powerful processors. But there can be no latency in these systems between event detection and response.

Battery systems. Hybrid electric vehicles (HEVs) and battery electric vehicles (BEVs) rely on storing energy in batteries. However,

battery systems are highly sensitive to variations in temperature. An inability to properly regulate the temperature in a battery pack will, at best, lead to the cells degrading too quickly and, at worst, result in a thermal runaway event that could cause a vehicle fire.

Displays and infotainment. With traditional dashboards being replaced with digital screens and head-up displays (HUDs) and infotainment displays becoming larger and communicating vital vehicle information to the driver, displays have to maintain good visibility even in direct sunlight or other adverse viewing conditions. Such highly luminous displays inevitably generate heat, which needs to be removed.

Electric drivetrain. It's not only batteries that present thermal challenges in HEVs and BEVs. As power components have finite

efficiency, running large amounts of power through them generates lots of heat. New developments are looking at doubling efficiency by using SiC semiconductors. However, as this also allows the volume of, for example, inverters and DC/DC converter devices to be cut by a factor of five, this is set to considerably exacerbate the overall thermal problem as this increases power density by up to 250%.

Telecommunications. Development in

Tailored thermal-management materials can make heat dissipation more efficient

In systems where liquid cooling and forced convection is available to move heat generated in electronics into the ambient environment, the major bottleneck in the heat transmission chain is the thermal interface between solid bodies, which the flow of heat is required to bridge. All the thermal problem areas listed above have multiple significant thermal interfaces.

Because assemblies always have tolerances, and normal industrially manufactured surfaces are never perfectly flat, attaching a heat source to a heat sink will always leave minute air gaps. And because air is a very good thermal insulator, these gaps create significant resistance to heat flow.

To mitigate this issue, the electronics industry uses thermal interface materials or 'TIMs'. These materials fill the interfaces, displace the air and replace it with a compound that has better thermal conductivity by two to three orders of magnitude. It is in these materials that Nolato Silikonteknik's expertise lies.

the logistics of data storage and processing will be a key driver of how automotive electronics interacts with cloud, fog and edge computing.

Autonomous vehicles. All of the above applies doubly to autonomous vehicles. Enabling true, full-scale autonomous driving systems will require taking the technology of the necessary systems and their thermal management to the next level.

Nolato Silikonteknik offers a multitude of different types of TIM, tailored to the specifics of various applications, assemblies, and production environments.

In almost all conceivable user cases for these materials, the overarching goal is to minimize thermal resistance and create an assembly that allows the smallest possible drop in temperature in the specific circumstances of the design.

Developing these materials is an exacting science. It involves balancing the thermal properties necessary for the desired effect with mechanical and electrical properties, along with any other relevant design parameters such as aging, ease and speed of production. This requires a highly specific skillset. It includes understanding the properties of the polymer matrix, particle interactions and rheology (studying the flow and changing shape of matter), and how altering the proportions or process parameters in a mixture can affect a combination of these properties.

Two new additions to Nolato Group management

Nolato expanded its group management as of June 1, 2021, with the addition of Camilla Magnusson, Group Procurement Director, and Glenn Svedberg, Head of Sustainability. The extended Group management provides an even more effective platform for identifying and leveraging group-wide synergies and further strengthening Nolato as a global strategic partner.

Camilla Magnusson has been with the Group since 2013 as Procurement Director for

Nolato Cerbo and Nolato Jaycare in the Medical Solutions business area. She has also led group-wide projects relating to Nolato's supply chain since 2017.

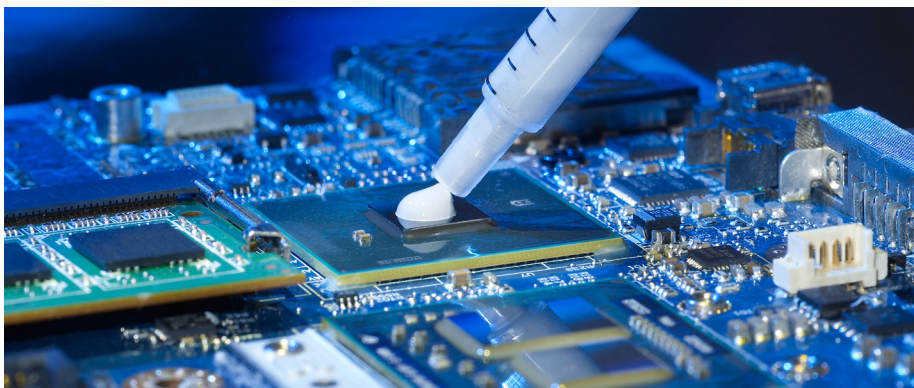
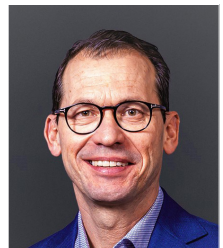
Camilla has previously worked as Global Commodity Manager at Siemens' gas and turbine division, and was employed by Saab/GM as a project manager within technology, procurement and marketing.

"As Procurement Director and a member of Group management, I will be working to consolidate the Group's position by building a platform for secure, ethical business transactions with our suppliers, while ensuring the supply chain strongly underpins Nolato's business," says Camilla Magnusson.



Glenn Svedberg joined the Group in 2007 as the Managing Director of Nolato Cerbo. Since 2017 he has also been in charge of Global Quality & Medical Excellence at Medical Solutions. Glenn has previously held a number of senior management positions at Rexam and Flextronics.

"My role involves making sustainability issues an integral and clear part of our business transactions, identifying and evaluating renewable raw materials that strengthen our business and keeping my ear to the ground on behalf of Group management for new technology, trends and legislation," explains Glenn Svedberg.



Thermal interface materials (TIM) in the form of pads or a paste displace air between electronics and the cooling component, substantially improving heat dissipation.



Nolato Hungary is seeing its fourth major expansion in nine years with the addition of more than 12,000 square meters.

Multiple expansions underway to boost capacity



A number of Nolato units are expanding to create new, efficient production space and boost capacity for forthcoming projects

Nolato Hungary

In Mosonmagyaróvár, western Hungary, around 20 km from the border with Austria and just off the motorway between Vienna and Budapest, is one of Nolato's largest production units in Europe, employing over 700 people.

Nolato has been present in Hungary for over 20 years and the Mosonmagyaróvár plant has been continually developed over that time.

"We're now expanding for the fourth time in nine years," explains Bart Nolden, Head of Production and Technology at Nolato Hungary. "The major extension that we built in 2018 is already at full capacity, so we are now adding 12,000 square meters to make room for future medtech and industrial projects.

"We'll also be bringing in the EMC production that Nolato Silikonteknik currently has in the neighboring city of Győr to give them better potential to grow. That will include a cleanroom for their production for automotive customers," adds Bart.

Following the expansion, Nolato Hungary will comprise a total area of 33,000 square meters.

Nolato Stargard, Poland

Nolato's Polish unit, based in the northern Polish town of Stargard, is planning a 4,000 square-meter extension for a new medical cleanroom.

Nolato Cerbo, Sweden

Nolato Cerbo in Trollhättan is building a new warehouse next to its existing production plant. The new storage facility frees up 2,500 square meters of production area in the existing spaces, which is needed for forthcoming projects. The warehouse is expected to be completed by summer 2022.

Nolato GW Dongguan, China

Nolato GW Dongguan has boosted its medical production resources by building new cleanroom capacity for medtech customers. Nolato GW Dongguan became part of the Group with the acquisition of GW Plastics in 2020.



Nolato Contour, United States

Nolato has had a production unit in Baldwin in the Midwest state of Wisconsin since 2010. It was extended in 2018 and now requires further expansion.

"We're now adding another 6,500 square meters to the plant, due for completion by spring 2022," explains Jonathan Baker, Key Account Manager at Nolato Contour.

"The new area will be used for production, including in cleanrooms, as well as for support systems and warehousing," adds Jonathan.

Not all of the cleanrooms are being fitted out initially and will be on standby for the anticipated increased need for cleanroom space, particularly for greater volumes of medtech products.



Nolato Treff, Switzerland

Nolato Treff, based in Degersheim in eastern Switzerland, has expanded its production facility by 3,750 square meters for industrial and medical production.

"All current space is at full capacity and we needed the room for new projects," explains Guido Vollrath, Managing Director of Nolato Treff.



Nolato plants trees in China

2021 saw the introduction of a tree-planting activity concept in Beijing. This involves all Nolato employees there having the opportunity to play the Ant Forest Activity video game. The game has become China's biggest private-sector tree-planting project and has led to more than 120 million trees being planted.

"Our employees can now collect 'green

energy points' by reducing their carbon footprint, for instance by taking public transport, not using a car, cycling and having a paper-free day. In the video game, these activities are converted into tree-planting. We estimate that in 2021 Nolato will contribute to planting more than 1,000 trees," notes Thomas Hofflander.

A specific tree-planting project has also

been undertaken at Longshen Industrial Park, where Nolato Beijing's production is based.

"We planted 30 trees as part of an inauguration ceremony for our own carbon neutrality park. We believe both large and small initiatives can help curb climate change," concludes Thomas.



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