

# Nolato Magasin

Nolato's Corporate Magazine | No 28 | November 2017

## Quality Swedish product succeeding in US retail market

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Nolato best supplier to Husqvarna | IATF 16949

CT scanning | New names reflect strategic progression

Nolato expanding in Hörby | Technology and efficiency are key

Both conductive and weatherproof | Medical Excellence

## One million brew units for coffee lovers

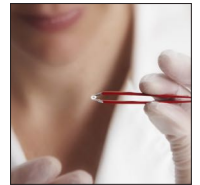
Nolato has produced one million brew units for Schaefer, which is internationally renowned for its coffee machines.



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## Liquid silicone offers new opportunities

Liquid silicone has many outstanding properties for injection-moulding, not just in medical technology.



➤ Find out more on page 8.

## Experience in consumer electronics

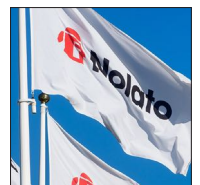
For 20 years, Nolato has been producing components for mobile phones, and this has now led to new customers.



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## A clever combination of local and global

Close cooperation and efficient decision-making combine with access to Group expertise and resources.



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## New names reflect our strategic progression



Christer Wahlquist  
President & CEO

Over the past decade, Nolato has made strategic progression from being a local component manufacturer to now being a hi-tech, solutions-oriented, advanced partner for our customers on a regional or global market.

*A solutions provider.*

We have also expanded

our customer offering by applying our significant know-how within mobile phones to other types of portable consumer products with integrated electronics.

To better reflect this progression, in 2017 we changed the name of our three business areas to Medical Solutions (previously Nolato Medical), Integrated Solutions (previously Nolato Telecom) and Industrial Solutions (previously Nolato Industrial).

The change should be seen as yet another step on our strategic journey. Our ambition is to continually advance our market positions by increasing the added value we provide in terms of innovation, polymer expertise and production skills.

By supplying complete solutions in the form of subsystems or finished products, we simplify and shorten our customers' time to market and help them create profitability.

And it allows us to continue on the path we have taken, with an innovative comprehensive approach and a strong customer focus, which gradually generates increased added value and consequently higher profitability for us.

Welcome to a new issue of Nolato Magasin.



Jimmy Wallin, Andreas Pettersson and Anders Willman accept the prize in the US.

## Prestigious award from Husqvarna

For the second time in four years, Husqvarna Group has named Nolato its best supplier worldwide and the recipient of the "Overall Performance Excellence Award".

At a ceremony in Charlotte, USA, at the end of June 2017, Jimmy Wallin and Anders Willman of Nolato Polymer and Andreas Pettersson from Nolato Gota received the award as Husqvarna's best supplier worldwide 2017 for "Outstanding Performance Excellence".

"We also received the prize in 2014 and are very proud and happy to be presented with this award," commented Anders Willman, Managing Director of Nolato Polymer. "It's a testament to the great work by all our employees and a valuable indication of Nolato's close and constructive cooperation with Husqvarna Group".

### Husqvarna's comments at the ceremony:

*"In a competition among several suppliers that have worked really hard and closely with Husqvarna for many years, this supplier has shown commitment and dedication that really stands out. They continuously invested in areas such as robotic automation and vision systems to be more competitive and prepared for the future. Importantly, they listen to their customers and have proven to be proactive at all times and at all company levels as a true partner."*

*"The spirit to exceed customer expectations is part of all employees' mindset. This is what EXCITE is all about – the need for tomorrow to be built today. Husqvarna is proud to present this year's Excellence award to: Nolato!"*



Our Magazine is produced for our customers, shareholders and employees, and anyone else with an interest in the Group.  
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Ground is broken on the new expansion, due for completion in early 2019.

## Nolato MediTech continues to grow in Hörby as it builds for further expansion

The current 7,000 square meters in Hörby will be expanded by a further 3,700 square meters. When this work is completed by early 2019, Nolato MediTech will occupy more than 11,000 square meters in Hörby.

### Strong development

“Our business has developed very strongly,” commented Torkel Skoglösa, Managing Director of Nolato MediTech. “The expansion mainly covers new production areas and will provide even better opportunities to continue our expansion in an optimal way.

“The further investment in Hörby will

create new jobs,” says Torkel Skoglösa. “We’re already looking for employees in all areas.

### Increased workforce

“We are hiring as we grow for the future and will staff the plant gradually. In five years’ time, we will have increased the number of employees by around 50.”

Nolato MediTech’s Hörby plant develops and manufactures medical devices for global pharmaceutical companies.

Nolato MediTech has 240 employees, 170 of which are based in Hörby and 70 of which are at the Lomma plant.



The factory in Hörby is adding new production area of 3,700 sqm (the darker gray parts).

## First IATF 16949 certification

Nolato Plastteknik in Gothenburg is one of the first companies in Sweden to be certified under the new automotive industry IATF 16949:2016 standard. It’s based on the new version of ISO 9001:2015 and replaces ISO 16949.

### Few interpretations

“As we were due for re-certification in 2017, we wanted to do this straight under the new standard, despite a tight deadline and the fact that there were few interpretations of the new standard,” says Anna Norlin, Senior Manager Quality & Environment at Nolato Plastteknik.

“So we made our own interpretations with the approach that if we were wrong this would be identified by the audit, and then we could correct things.

### Intensive work

Intensive work was required to introduce the standard before the audit, particularly as Nolato Plastteknik was also changing the IT support for its business systems at the same time as upgrading its management system for the new standard.

“But since our business system provided a good basis to work from, with processes described in detail, it went well and the certificate is now hanging proudly in reception.”

## New sand blast plug from Nolato Hertila

Nolato Hertila has developed a new effective screw plug for sand blasting and painting. It prevents blast grit from getting into screw holes and results in a minimal shadow when painting. A screwdriver notch allows for easy application and removal.



The plug prevents the ingress of blast grit.



*Based on its experience from developing the professional model, Husqvarna, together with Nolato, created a lower-specification version of the leaf*



## Blown away by success on US retail market

*When developers at Husqvarna Group wanted to challenge themselves by developing and producing a high-quality leaf blower in Sweden for the tough US retail market, they chose Nolato as a cooperation partner.*



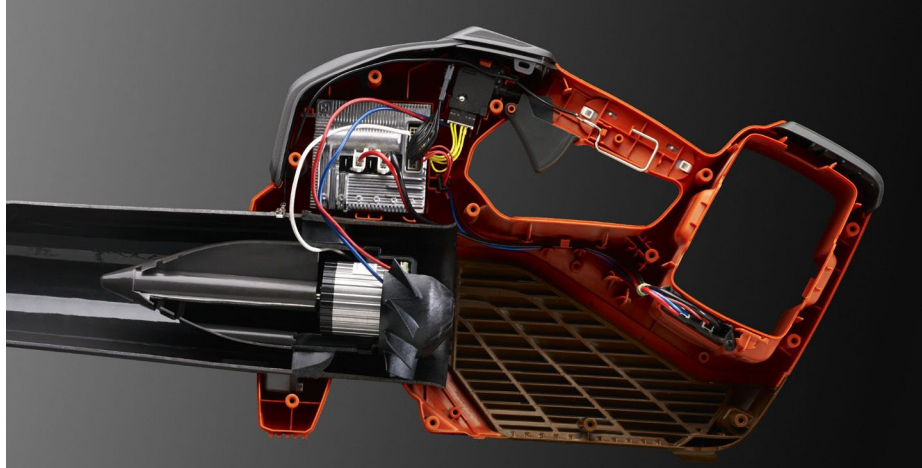
*blower for the price-sensitive US retail market.*

Battery-powered products for park management and gardening are an area of interest that's showing significant growth.

Greater environmental concern, together with a desire for low noise levels when working in sensitive environments, means battery-powered equipment is becoming increasingly popular.

### Best in class

Nolato has cooperated with Husqvarna on forestry and gardening products for many years. In two current projects, Nolato Polymer, based in Torekov in Sweden, has been involved in the development phase



*The design of the inside of the cowling was important for optimising air flow.*

and in producing numerous plastic components for two series of battery-powered leaf blowers.

"The first project was for a series of professional blowers," says Jimmy Wallin, Senior Manager Marketing and Sales at Nolato Polymer. "Husqvarna wanted the new series to move on to the next level and be the best in class."

### Plenty of puff for the price

"Part of the objective was to achieve perfect balance and ergonomics," explains Jimmy Wallin. "Not just with regard to the overall leaf blower and what it feels like for users to hold, but also for the fan to be perfectly balanced so the blower is as free of vibrations as possible, and the background noise from the fan was eliminated.

"As they rotate at 24,000 rpm, we now check the fans using special measuring equipment to ensure the balance is within the stringent tolerances specified by Husqvarna. A lot of effort was also put into creating strong air flow with minimal energy consumption, which required a lot of optimisation of the inside of the cowlings."

### Looking for a challenge

In the second project, the aim was to develop a lower-specification version of the blower for the US retail market. Husqvarna has an explicit strategy of protecting itself on the professional market by also providing competitive, good alternatives on the consumer market, despite pricing pressure. This makes it harder for competitors to break into the professional segment via the retail market.

"Previous models aimed at the retail market have been produced in Asia,"

says Christian Bylund, Lead Engineer at Husqvarna Research & Development. "But in this case we wanted to challenge ourselves and supply a high-quality Swedish-manufactured product that would be competitive even in the highly price-sensitive US retail market. The product would be developed and manufactured in Sweden, but would be sold in stores and hypermarkets in the US, as well as through major online retailers.

"So we worked a lot on the cost structure, adapted components and changed materials to reduce the production cost. The project had a tight schedule; when we asked Nolato to support us, there were only six months until the product was due to start production."

### 100% delivery at top quality

"The tight schedule meant all aspects were a high priority. Nothing could go wrong," comments Christian Bylund. "And it worked! We got exactly the product we had designed and we were bang on schedule.

"Nolato provided valuable and proactive support during the development phase by finding the solutions we needed and the project was officially completed with 100% delivery at top quality – it was an incredibly successful project.

"We also demonstrated, not least to ourselves, that we can compete in a price-sensitive market with a Swedish-made product. Sales are going great and the next challenge is to automate production."





*Schaerer's coffee machines are used in professional environments that place stringent requirements on function, reliability and great coffee.*

# One million brew units produced for Swiss coffee



*58 components to make great-tasting coffee.*

*Switzerland-based Schaerer is internationally renowned for its professional coffee machines, which it has been manufacturing for 90 years. Nolato has been working closely with them for many years and to date has manufactured one million advanced brew units for these machines.*

Schaerer coffee machines are designed to brew great coffee in professional environments such as restaurants and bars, as well as for use in more public environments such as petrol stations and waiting rooms. This not only places stringent requirements on the reliability and robustness of the coffee machines, but also on them brewing great-tasting coffee day in, day out.

So a key component of the coffee machines is the brew unit, which is produced by the plant that Nolato acquired in

Switzerland last year, Nolato Treff.

“The brew unit is a highly complex product consisting of 58 different components. Twenty of these are plastic and are manufactured by us,” explains Nolato Treff’s Managing Director Guido Vollrath. “The remaining 38 components, which are mainly metal, are purchased in by us based on Schaerer’s specifications.”

The manufacturing process takes place in three phases. The plastic components are first injection-moulded, and then some of the components are fitted together using



*Katarina Neskovic is part of the team at Nolato Treff in Degersheim, Switzerland, that assembles the brew unit.*

ultrasonic soldering, after which final assembly takes place.

Small tolerances are needed to ensure the individual components fit together perfectly, which requires highly stable processes.

“We also have to use specially selected raw materials to keep to the specifications,” explains Nolato Treff’s Managing Director Guido Vollrath.

### Food hygiene

All production takes place in clean zones, with special rules on clothing and working conditions, as it involves components that come into contact with foodstuffs.

“Following our meticulous production regulations means we can guarantee food safety and maintain our ISO 22000 certification,” comments Guido Vollrath.

To date, Nolato Treff has manufactured 1,000,000 brew units for Schaefer in close cooperation, which has intensified since Schaefer became part of Germany’s WMF Group a few years ago.

# 100% quality-assured beaded gaskets

*Nolato Lövepac has developed a new method for checking beaded gaskets, providing 100% in-line quality assurance.*

Mainly for customers in the automotive industry, Nolato Lövepac manufactures a type of rubber-coated metal gasket that is used, for example, for sealing gear boxes. To optimise sealing, these gaskets are provided with a bead (groove).

“Even a small tear in the rubber over the bead increases the risk of a leak, so we have to inspect each gasket before it goes to the customer,” says Jesper Johansson, Head of Sales at Nolato Lövepac.

### Developed own solution

As traditional control systems using inspection cameras can’t identify these kinds of tears, until now the gaskets have been inspected manually after production. But now, through its internal improvement measures, Nolato Lövepac has developed a method for automatically checking each gasket in-line.

“We work on the basis of being a little better than we were yesterday. One of the aims of this work is to have high productivity while supplying zero defects to customers,” explains Jesper Johansson. “This

solution not only makes for even more satisfied customers, but also improves productivity.”

### Cross-departmental groups

In larger improvement projects, Nolato Lövepac uses the PDCA (Plan, Do, Check, Act) method in cross-departmental groups. The groups include an engineering manager, production manager, quality manager, supervisors, quality assurance representatives and machine operators, providing good opportunities to make quick decisions and then implement the measures.

“To provide an even better basis for improvements, we have also invested in automatic OEE (overall equipment effectiveness) systems, which log all machinery processes,” explains Jesper Johansson.

“Because continual ongoing proactive improvement efforts are key to innovation and increased productivity that make us more competitive and provide better opportunities to be the customer’s cooperation partner of choice.”



*Jesper Johansson, Mikaela Enoksson, Johnny Månsson, Anneli Sjö, Conny Bengtsson and Ola Hultberg are members of a cross-departmental group at Nolato Lövepac.*



*Silicone can also be injection-moulded into extremely small components weighing as little as 0.001 grams.*

# Injection-moulding with liquid silicone offers a world of new opportunities

*Nolato is one of the world's leading manufacturers of components made from liquid silicone. It's a material with many outstanding properties that make it the best choice for many applications, particularly in medical technology as well as other areas of use.*

Silicone (with an 'e') is not a chemical element but consists of silicon (without an 'e'), which after oxygen is the most commonly occurring chemical element on earth.

As a material it offers many benefits compared with other polymers, as its strong chemical structure with alternating atoms of silicon and oxygen (Si-O-Si) can cope with both severe cold and heat and tolerates exposure to UV radiation. It

doesn't conduct electricity, it isn't water-soluble and tolerates chemical effects relatively well. It is also fully biocompatible, which means it can be used with no problem on and inside the human body.

## **Biocompatible and non-toxic**

"Its biocompatibility is one of the reasons that silicone is commonly used in med-tech," explains Robert Ottocan, Silicone Product Manager at Medical Solutions.

"The material is also non-toxic, doesn't have any known allergens, is flexible, elastic and reverts to its shape after being squashed or stretched."

Liquid silicone has low viscosity, making it suitable for items with complex shapes. For instance, silicone can be injection-moulded with thin walls, down to 0.1 mm, and as extremely small components, weighing as little as 0.001 grams.

"Liquid silicone can also be injection-

moulded with undercuts and negative release, which is a big advantage over injection-moulding thermoplastics,” notes Robert Ottocan.

### From soft to hard

“Lots of people think silicone can only be used for soft, flexible products but the material exists as everything from gel form to a material that’s as hard as thermoplastics.”

Designers can also use 2K or 3K injection moulding, you can even injection-mould plastic overmoulded with silicone of varying hardness to create the desired functionality.

### Experience and expertise needed

So what’s the catch with this amazing material? Why isn’t everyone using silicone?

“That’s mainly because it’s difficult to injection-mould liquid silicone. You really have to know what you’re doing and have extensive experience,” explains Robert Ottocan. “The advantages of the material, such as its viscosity, also make it very hard to master.”

Nolato MediTech, based in Hörby, Sweden, has over 40 years’ experience of injection-moulding liquid silicone for advanced medical devices, many of which are intended to be fitted inside the body. Around five years ago, the technology and expertise was exported to US-based Nolato Contour, which is now successfully injection-moulding liquid silicone for medical technology customers.

### More than just medtech

Silicone is also used by Nolato in many other contexts beyond medical technology. And it forms the basis of Nolato Silikon-teknik’s business in Hallsberg in Sweden and in Beijing. Adding particles of silver and graphite creates a material that shields against electromagnetic induction. This is used in many areas of electronics, such as protecting mobile network base stations from interference by other electronics.

Silicone also has significant potential in the automotive industry, where properties such as heat resistance, flexibility and chemical resistance are of great importance.

# The end-to-end solution: A clever combination of local and global

*For Nolato it’s important that its customer offering combines close cooperation and efficient decision-making with access to the entire Group’s expertise and resources.*

From an early stage, Nolato’s organisation was based on the fundamental philosophy that it is capable individuals, with know-how and good ideas, that create successful cooperation with the customer.

### Decentralised decision-making

“This approach is still highly relevant for us today,” comments Nolato President and CEO Christer Wahlquist. “We therefore remain a highly decentralised group, which provides a stable basis for committed and motivated employees. It also enables us to take business decisions close to operations and customers.”

### One Nolato

“But while this means that it’s the individual parts of Nolato that make up the whole, it’s the whole that defines those individual parts,” explains Christer Wahlquist. “Because, although we have

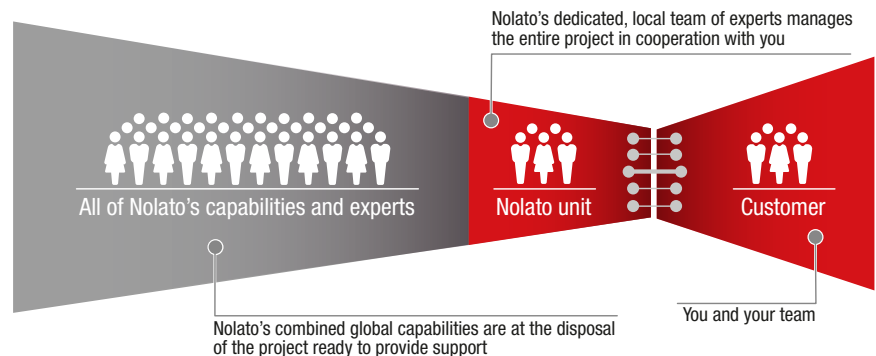
a flat organisational structure with efficient decision-making lines and significant local influence in all areas, we are also one Nolato.

“Our operations are based on a shared foundation. We have shared values, shared technology and shared goals. So cooperation is always based on the individual Nolato unit’s resources and expertise, as they are the ones who understand customers’ particular needs and preferences.”

### Access to all resources

“On top of that, if necessary, we can provide support through the entire Group’s combined resources, while responsibility remains with the local unit.

“We think this is a perfect combination of local and global, which is fully in line with our fundamental approach to how to best create satisfied customers.”





*Medical Excellence also provides a guarantee that customers will have their products produced at the right quality, the right time and to the right*

# Medical Excellence tool to create a world-class business

*The Medical Excellence concept is now being rolled out across all Medical Solutions units, with the aim of creating a world-class medical business.*

“We already have a highly effective and quality-focused operation within our business area,” says Johan Iveberg, President of Medical Solutions. “But we’ve also grown considerably, both organically and through acquisitions, and we now want to ensure that all parts of our business have the same focus on quality, customer value, efficiency, sustainability and safety.”

Medical Excellence is essentially based on the principles and values that together constitute the Nolato Spirit and that underpin the entire Group. These are then developed with additional factors in order to best address the specific conditions of the medical technology and pharmaceutical sectors.

“Medical Excellence isn’t actually a particular way of working, it’s more of a way of approaching our work,” explains Glenn Svedberg, who along with his job as Managing Director of pharmaceutical packaging producer Nolato Cerbo is now also taking on the role of global responsibility for quality assurance for the entire business area.

## A can-do attitude

“We don’t just work from physical factors, we also work a lot from softer values such as involvement, commitment and, in particular, a can-do attitude. If we constantly aim to exceed our customers’ expectations we will have come a long way towards

achieving our goal of ensuring long-term strong competitiveness for both our customers and ourselves.”

## Continuous improvements

So, for example, a constant quest for new and better ways of doing things is an important element of Medical Excellence. Employees cooperate to make their day-to-day work even more efficient, easier to perform and more satisfying. This gives everyone a better understanding of the business, the big picture and the individual’s role in this.

“Before Medical Excellence I used to just accept problems and things that couldn’t be done,” explains machine operator



specifications.

Michal Al-Assaf. “Now, I see opportunities for improvements everywhere, it’s like a wheel that’s constantly turning and gaining momentum from positive results every day.”

### Commitment is key

Employee involvement is probably one of the most important elements of the Medical Excellence approach. Their capabilities, skills, desire to learn and ability to adapt are valuable in making continual improvements.

“Line management is trying to solve problems by being actively present in the place where the value occurs, rather than staying in their silo,” explains Glenn Svedberg. “By being visible and available, they provide supportive leadership that involves employees and generates a culture of transparency, mutual trust, teamwork and continual learning.”

### A guarantee for customers

The Medical Excellence system also provides a guarantee that customers will have their products produced at the right quality, the right time and to the right specifications. Key performance indicators on safe-

ty, quality, service level and efficiency are measured continually. Not just to monitor the constant ongoing improvement efforts but also to ensure that the business is complying with laws, regulations and standards and fulfilling the principles of lean manufacturing and good manufacturing practice (GMP).

### Environmental concern is integral

As part of the commitments under Medical Excellence, the company also takes responsibility for sustainable development by reducing the environmental impact of both the business and its products. In all processes, environmental concern is a natural element in reducing emissions to air and water, and to minimise waste and consumption of water, energy and other natural resources.

“There’s actually nothing surprising about this, it’s not exactly a groundbreaking idea,” says Johan Iveberg. “But we have put everything into a coordinated system, with everyone working together, towards the same objectives and collectively helping to achieve our vision of operating a world-class business.”

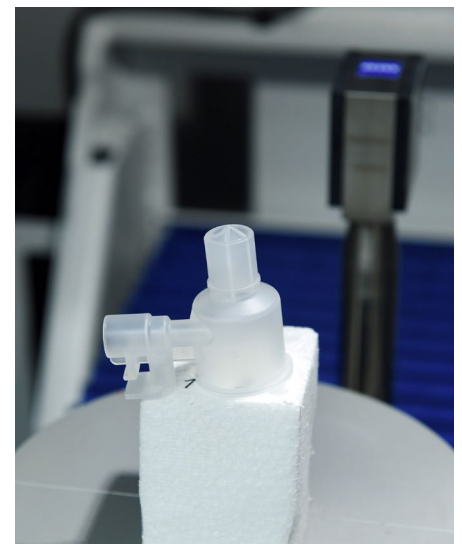
## Even more stable processes with CT scanning

To quickly generate a digital three-dimensional image of a new plastic component, Nolato now uses computed tomography, known as CT scanning. A digital scan provides us with the precise measurements, as well as cavities, which often cannot be otherwise measured.

“CT scanning is an amazing tool, particularly for optimising an injection mould,” says Guido Vollrath from Nolato Treff, which is based in Degersheim, Switzerland. “In half an hour we can obtain a precise image, a 3D drawing of the actual outcome of a test run.

“By comparing the digital reality with the designer’s CAD drawing, the computer can then perform a deviation analysis showing how reality matches the specifications. This automatic calculation can then be used to optimise moulds and process parameters.

“CT scans are a really great tool. Not just for cutting lead times for volume production, but also for creating even more stable processes, which benefits both us and our customers,” adds Guido Vollrath.



*In 30 minutes, the CT scan creates a three-dimensional drawing of the actual outcome of a test run, including all cavities, in order to optimise tools and processes.*



*The mobile phone sector is still an important customer group for Nolato, but this is now being added to by customers producing activity trackers, exclusive speaker systems, Bluetooth-enabled jewellery, vapouriser heating products and other consumer products with integrated electronics.*

# Expertise in portable consumer electronics leads to new customers

*For 20 years, Nolato has developed and produced advanced components for portable consumer electronics products. These have mainly been complex polymer product systems for a wide range of mobile phones that face stringent customer demands in terms of design and short lead times.*

Nolato's journey in the mobile phone sector began 20 years ago, when the company took over production of plastic components for Ericsson's mobile phones. Even then, the requirements for advanced technology, quality and cosmetic content were demanding, and requirements have increased ever since.

"Working for such a long time with the stringent requirements of the mobile phone sector on tolerances and perfect cos-

metic execution, combined with extremely short lead times, high volumes and flexibility has taught us a huge amount about portable consumer electronics." So says Patric Mattsson, who has been involved throughout this journey and is now Marketing and Sales Director of Nolato's Integrated Solutions business area.

"We've not only optimised our know-how and learnt from our experience, but we've also developed a technical environ-

ment that's ideally adapted to offering our customers development support, electronics integration, rapid ramp-up of projects and flexible production.

"This means we now have a very strong platform from which to also help customers within other types of portable consumer electronics as well as mobile phones."

Expanding the business area's operations to also include customers outside the mobile phone sector has long been a stra-

tegic goal for Nolato. In particular, to offset the significant fluctuations in sales and earnings that come from the entirely project-related mobile phone production.

Recent years' significant growth in the segment for shielding against electromagnetic interference (EMI) has helped offset fluctuations in Integrated Solutions. But Nolato's mobile phone business in Beijing has also worked hard to attract new customers in other areas of technology to benefit from Nolato's expertise in the production of advanced consumer electronics. The results of this work are now starting to be seen.

### New products beyond telecom

This expansion has resulted in the Beijing factory also developing and producing activity trackers, exclusive speaker systems, Bluetooth-enabled jewellery and vaporiser heating products for e-cigarettes, in addition to mobile phones.

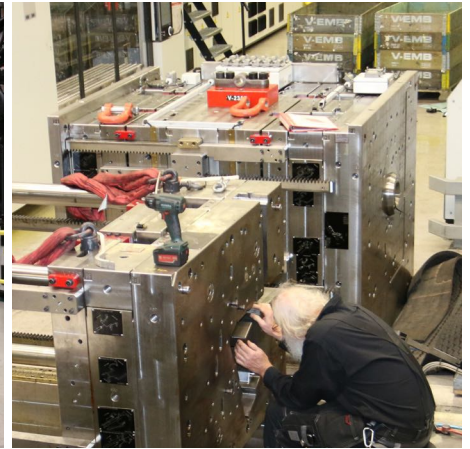
The latter is a completely new area. Although it may not be immediately evident, these products place the same requirements on Nolato as mobile phones. They comprise an exterior element with stringent requirements on visual and tactile cosmetics and quality, as well as an internal element with integrated electronics and high demands on functionality.

"We're also involved all the way from development to consumer packaging of the finished product, so it's ready to be placed on a store shelf somewhere in the world. It's a combination that suits Nolato very well," says Senior Product Manager Mattias Bengtsson.

### Swedish-Chinese advantage

"Although we're small compared with the giants of the industry, we offer an advantage for customers from Europe and North America that are looking to create something new," says Mattias Bengtsson. "Our mix of Swedish and Chinese culture means we can help customers, listen and propose good solutions, as well as excelling at implementing those solutions.

"We also have the advantage of being a flexible and committed organisation that can act as a sounding board for our customers when they know what they want to do but perhaps not exactly how."



Efficiency is gained from driverless forklifts and mould maintenance right next to the injection mould machines.

## Technology and efficiency are key to success in automotive sector

*The automotive industry has long been one of Nolato's main customer groups. It's a sector with a strong emphasis on technology and productivity, so effective production solutions are key to business.*

Gothenburg is home to one of Nolato's units with a large proportion of automotive customers. This is where lots of components for Volvo Cars' new models are built using its SPA platform for the 40, 60 and 90 series. The customer is German automotive component maker Brose, which has a factory in Gothenburg producing items such as door systems.

"We've worked with Brose for more than 10 years," says Christian Meding, Head of Marketing and Sales at Nolato Plastteknik. "We started with small basic products and processes, and now we're making larger and increasingly complex components that not only require extensive expertise, but also efficient internal and external logistics solutions."

### Carrier plates for Volvo

The latest addition to products for Brose are carrier plates for Volvo's next V60 model, which starts production in 2018. Nolato is producing all carrier plates for Brose and Volvo for cars produced at Volvo's Torslanda factory.

"A carrier plate is a large, complex plastic component of the door on which the many important functional components required

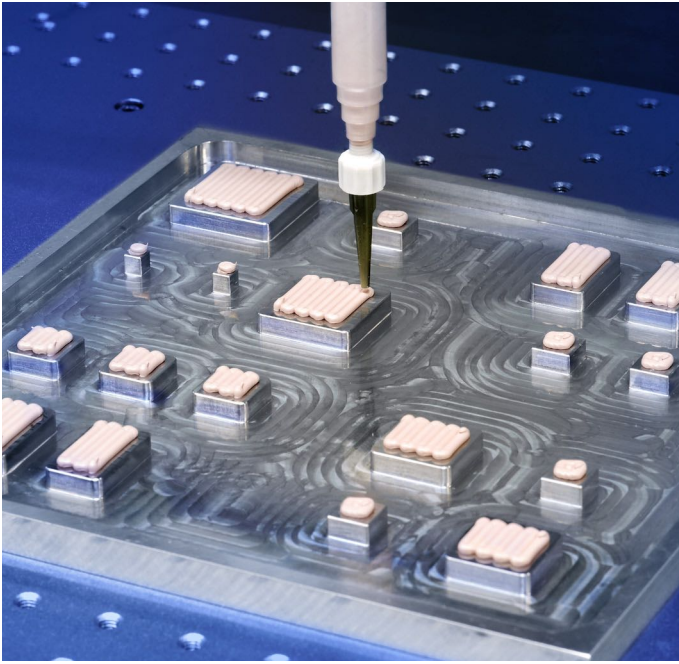
in a modern car door are fitted," explains Christian Meding. "Producing the item in plastic rather than steel saves up to 1 kilo per door, which is a valuable saving in the automotive industry, which is constantly trying to reduce the weight of vehicles."

### Highly efficient flow

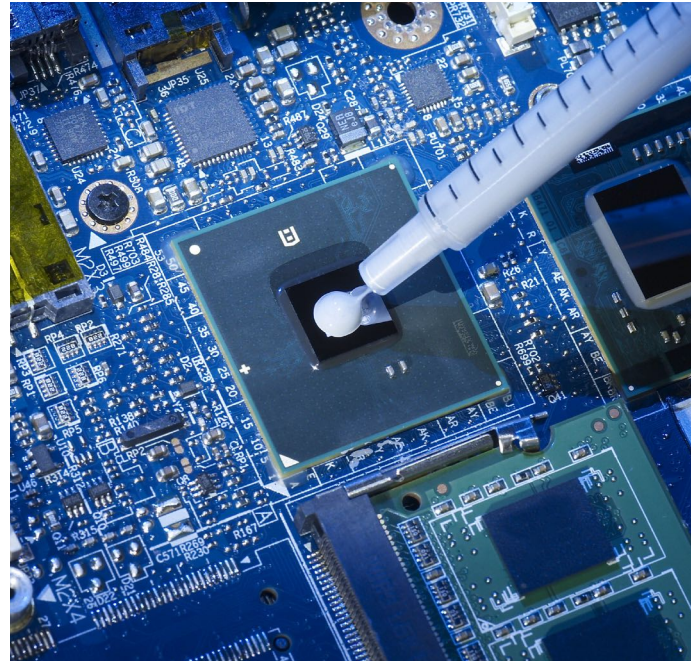
Production of the carrier plates continues around the clock and requires a highly efficient production flow. This includes the use of two 1,700 tonne injection moulding machines, which are positioned right next to each other for optimised logistics. The items, which are hung on special containers after injection moulding, are transported by driverless forklifts.

The items are produced using a two-cavity mould that weighs over 20 tonnes and requires large equipment to handle it.

"As we manufacture carrier plates for a number of different models and we often have to switch moulds, minimising the time taken to change and maintain the mould is a key factor," notes Christian Meding. "We solved this partly by ensuring we can maintain the moulds in the production facility instead of having to move them some distance."



*Compatherm Filler remains in a liquid state during assembly, with only a minimal impact on the components.*



*Compatherm Paste enables a bond line of a few tenths of a micron, which is two orders of magnitude less than pads and fillers.*

# Efficient heat dissipation with two new thermal interface materials

Nolato has recently launched two entirely new thermal interface material (TIM) product lines.

## Compatherm Filler

Compatherm Filler fills gaps between heat-generating and heat-dissipating components and therefore has roughly the same function as the previously launched Compatherm Pad while offering several unique advantages:

“The material has a minimum thickness at the bond line of just 0.2mm, irrespective of the original thickness, allowing for a much thinner design than with pads, even for large tolerance spans. Furthermore, the material is dispensed in a liquid state, making contact resistance very low even at low contact pressures.”

Compatherm Filler is highly suitable for automated dispensing, which could potentially mean low production costs even for high volumes. Since the material remains in a liquid state during dispensing and

assembly, it only has a minimal impact on the components in the assembly phase.

“The BOM listing is simplified by the fact that the geometry is only determined by the dispensing equipment’s programming, as different TIM geometries don’t require different items and part numbers.

“Once the material has cured to fit the geometry it is assigned on application, it is capable of withstanding both strong vibrations and CTE movement. The material therefore has rapidly grown in popularity in sectors such as the automotive industry.”

## Compatherm Paste

Compatherm Paste belongs in the thin bond line category of TIMs. It creates the thinnest possible film between the heat source and heat sink, in order to provide the lowest possible thermal resistance.

“The thermal resistance of a TIM is proportional to the material’s bond line, and inversely proportional to its contact area

and thermal conductivity,” says Jussi Myllyluoma. “If everything else remains constant, a significant reduction in the bond line thickness will also bring about a substantial reduction in the resistance, and thus improved cooling.

“Compatherm Paste allows a bond line thickness of as little as a few tens of microns. Compared to gap-filling materials such as pads and fillers, which typically range from tenths of a millimetre to several millimetres, this means a reduction in the interval of one to two orders of magnitude. Consequently, this also means a reduction in thermal resistance to a corresponding degree,” explains Jussi Myllyluoma.

The line includes a number of different products optimised for a range of requirements, from high-power chip cooling to IGBT and LED applications.

*Samples and technical data are available at [thermalguide.nolato.com](http://thermalguide.nolato.com).*

# New EMC gasket combines conductivity and weatherproofing

*Injection-moulding silicone materials that are conductive and weather-proof is both innovative and complex, but highly effective.*

The enhancement of products and new technology constantly require new solutions for different components. On this occasion it's telecom technology in the form of base station transmitters using increasingly high frequencies and fitting into ever smaller spaces that has created the need for a new type of gasket.

Put simply, a gasket providing EMC shielding that also protects against moisture and rain, and that is produced quickly using 2K injection moulding.

"The conductive silicone, Compashield, was developed in our own lab by our

R&D department," explains Karin Sundberg, Development Engineer at Nolato Silikonteknik.

"All the materials are produced in Hallsberg, Sweden, based on our own formula and are specially adapted to cope with the all shielding requirements, from low to high frequencies."

"The gasket also had to have three pre-manufactured cable entry points that mustn't effect functionality," notes Tore Nilsson from Nolato Silikonteknik's project department. "There were numerous challenges along the way. The trickiest was

injection-moulding two materials with such different properties.

"But now, around one and a half years after the start of the project, everything is in place; the machine, the moulds and the method, so volume production can start for the customer that needed the new gasket."

"This could eventually become a significant product," comments Roberth Axäng, Head of Production and Logistics at Nolato Silikonteknik. "And I don't just mean for the telecom sector. Modern cars are starting to resemble base stations on wheels with a range of functions that mustn't disrupt one another. In that respect, I think that products of this type have a promising future."

## Online guides provide free samples and interactive design support

Free samples of gaskets – both thermal and EMC – from Nolato Silikonteknik are now just a few clicks away on your computer, smartphone or tablet.

And the next innovation may soon be here: an interactive design guide to thermal interface materials.

"We have developed and manufacture a variety of leading materials that are both thermal and electrically conductive. It's difficult to describe the product range, which is both extensive and in-depth. It's

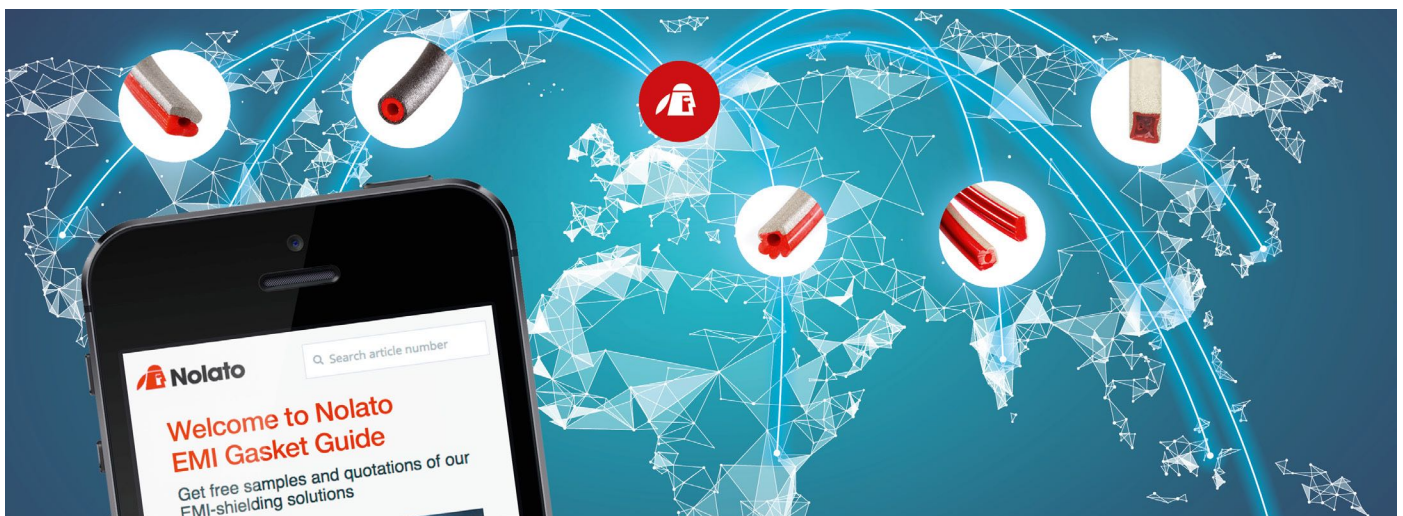
simpler to say what customers need is usually available," says Jussi Myllyluoma, Head of Product Line Thermal at Nolato Silikonteknik.

And now it's possible to find and order one or more free samples of Nolato's gaskets quickly and easily. When customers have chosen the gaskets they want to test – based on material, profile and thickness – they will be delivered to the customer's address.

Some 20 different materials can be

selected, each of which can, in turn, be manufactured to different thicknesses. It can be difficult at the design stage to find precisely what's needed.

"The idea is for the customer to enter particular data about the product. Once the guide has processed this information, it can provide a relevant recommendation regarding the selection and thickness of the materials. Based on this, the customer can order free samples to test in the design process," explains Jussi Myllyluoma.





## Meet Torbjörn Brorson, Nolato's Head of Sustainable Development:

Plastic is currently facing criticism. How does this affect Nolato's sustainability work?

"A lot of the criticism is about plastic ending up where it shouldn't, such as in the sea. Up to eight million tonnes of plastic end up in the sea every year, harming fish and other animals."

But plastic shouldn't end up in the sea.

"Pollution is perhaps the most concerning issue that the world faces. Plastic breaks down very slowly in nature and can remain for hundreds of years. So it's clear that the collection and recycling of used plastic products isn't keeping pace with plastic production."

What happens with Nolato's plastic products?

"Every year, Nolato uses around 30,000 tonnes of plastic. A large proportion of the products that Nolato manufacturers are long-lasting and used, for example, in vehicles, garden machinery, mobile phones, furniture and medical equipment.

"These don't constitute a major problem in this context and the products themselves are often subject to legal requirements and well-developed systems for recycling." But Nolato also produces plastic products with a short lifespan.

"Yes, these include consumer packaging for pharmaceuticals and food supple-

ments, which usually ends up in domestic waste and is then burnt in a controlled manner."

Does Nolato have a strategy concerning the environmental impact of plastic?

"Yes, we have made significant progress in our work to phase out additives that are hazardous to humans and the environment. As Nolato's main raw material is plastic, we take care to minimise waste and scrap. We also have a target to increase the use of recycled plastic, as well as plastic that doesn't come from fossil raw materials, i.e. bioplastics."

Are bioplastics the solution for the future?

"This is where it gets a bit complicated. You first have to differentiate between bioplastic and biodegradable plastic. Bioplastics are made from plants like maize or sugarcane and consist of exactly the same polymer chains as in fossil plastics.

"So the properties of bioplastic are identical to those of traditional plastics, but they come from a renewable raw material and have a much lower carbon footprint. This type of plastic can be recycled using the same systems as for fossil plastics.

"But there are also question marks over this type of plastic. For example, many question whether it's appropriate for

foodstuffs to be used to produce plastic. Labour and environmental issues in cultivation are also important.

"And not all bioplastics are biodegradable, whereby microorganisms break down most of a material into water, carbon dioxide and residual substances. And those that are biodegradable cannot be disposed of via regular plastics recycling, as they destroy the properties of the recycled plastic."

What's your view on developments in this field?

"The environmental performance of products has become an increasingly important competitive factor for our customers, so there is an interest in changing and improving. In this respect, we consider ourselves to be a knowledgeable partner that can support our customers with green technology.

"Some industries are cautious and try to avoid changes as it can have an undesirable effect on product performance. In the medtech and pharmaceutical sector, for example, the fundamental rule is to use virgin materials.

"I believe that debate will drive development towards more non-fossil plastics being used and better recycling systems. Hopefully this will also influence human behaviour so that used plastic products end up where they should."