



Synthetic Lubricants & Engineered Fluids

Smooth operations to
improve your bottom line



Let's build better business – together

Together we have better chances of meeting downstream customers' requirements and consumers' expectations, which are getting tougher and tougher.

IT IS INCREDIBLE how fast things change these days. It seems as if we live in a continuous paradigm shift spanning so many parts of our lives. Our industry is no exception. One example is the refrigeration sector, where we have witnessed the phasing out of ozone-depleting refrigerants. Now there is a sharper focus on GWP (Global Warming Potential).

The same kind of changes hold true for many other industry segments, where synthetic lubricants are increasingly used instead of mineral oils. The possibility to tailor synthetic lubricants to specific properties is now making them the go-to choice for applications such as aviation turbine oils (thermal stability), metalworking fluids (reduced volatility) and engine oils (polarity).

The challenges presented in the market today are often demanding, but a lot of good can come from them too. Our industry needs to keep up with the trends, and to do so we have to start cooperating more throughout the value chain. Together we have better chances of meeting downstream customers' requirements and consumers' expectations, which are getting tougher and tougher.

A new business model is required, and Perstorp is committed to helping you future-proof your business. Working with us, a one-stop shop for high quality raw materials for polyol ester

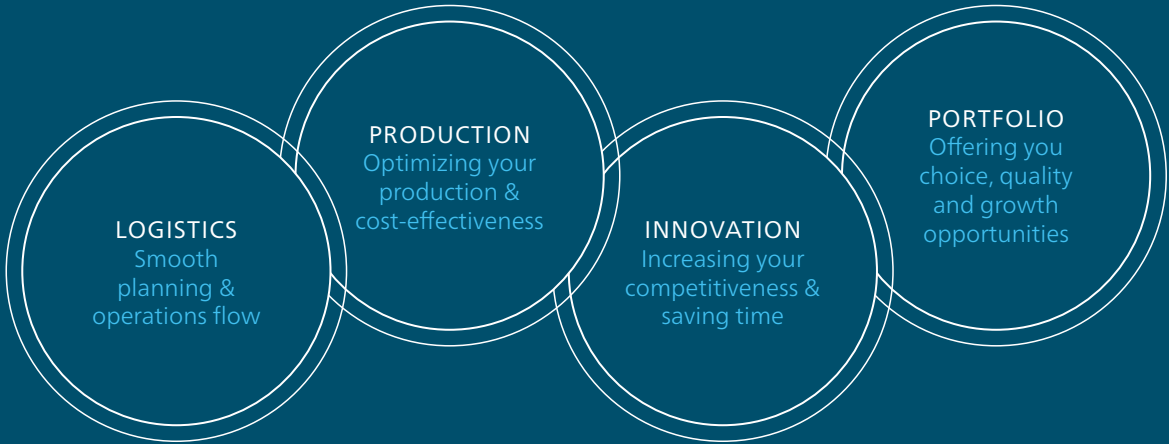
base stock is a given. But our cutting-edge polyols, acids and alcohols are only the beginning. We are increasingly partnering with customers, together analysing and coming up with superior solutions for logistics, innovative products and sustainability. These are areas where we commit to making a difference, helping our customers to get ahead.

Going beyond products and price, our dedicated segment teams can help you get a thorough understanding of the total cost of your business. This includes identifying and handling "invisible costs", such as administration, waste, internal transport and other indirect costs.

So, let us work together. The benefits for you are minimal downtime, cost-effective production and a competitive product portfolio. And ultimately, peace of mind.

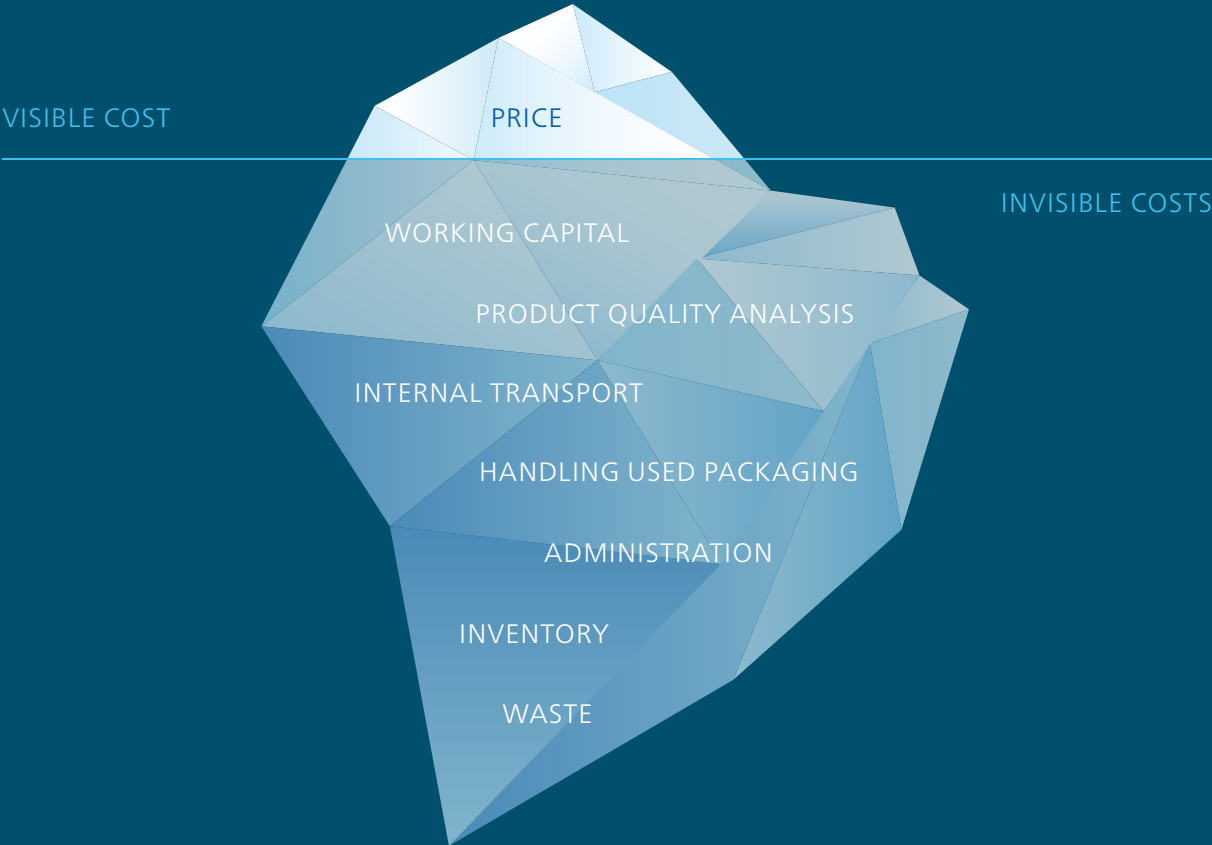
Andreas Nilsson
Market Segment Manager

TOTAL COST MANAGEMENT



BETTER BUSINESS

BRINGING THOROUGH KNOWLEDGE about the entire product life cycle, and deep understanding of the entire value chain, Perstorp is forging performance-driven partnerships with an increasing number of customers. Going beyond price and visible costs, we can re-focus on managing and reducing the customer's total cost, including invisible costs.



Logistics on your terms

PRODUCTION DISTURBANCES, or even worse, downtime, are a nightmare for every manufacturer. When we talk to customers about logistics, they always bring up two things: they want shorter lead times and security of supply. They also need to be super flexible, keeping stocks as low as possible.

To help out, we at Perstorp can tailor our part of the supply chain to meet your specific needs. Some of our customers already benefit from our strategic storage locations around the world; others from the tanks and depots that we have put up close to key customers. So even if your facility is not geographically close to our production, you can get your Perstorp products from the nearest harbour or a specific depot that will reduce the distance even more.

To make your production process run smoother we can also tailor packages to your specifications. The exact quantity in every batch means reduced waste, and more cost-efficient production.

Secondly, we can be your logistics partner. Mapping your logistics, our cross-functional team gets a deeper understanding of your transport system and process flows. We get a comprehensive picture of your challenges and how we can support you in optimizing your operation.

This is not a standardized plug-and-play solution. Success comes from cooperation, where the right people get together. That is when we can find the solutions that will shorten lead times and secure your supplies, reducing your costs in the process.



Per Igglund
Global Supply Chain Development Manager

Creating customer-specific logistics

As of October 2016, Per Igglund took up the position as Global Supply Chain Development Manager, working as a liaison between Perstorp and its customers.

Why was a special position created?

"We want to make sure that we really understand our customers' overall logistics and supply chain set-ups, all the way from agreement to delivery. This requires a closer dialogue. Based on what I learn, I can then bring in a cross-functional team."

How does it work?

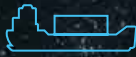
"I will visit new customers' facilities. We can suggest improvements in our existing customers' set-ups, or advise them prior to construction or renovations."

How does the customer benefit?

"With in-depth knowledge, we are able to create customer-specific concepts, services and products that secure supplies, reduce lead times and environmental impact as well as cut costs."

What is the first step?

"The customer's logistics and supply chain are always on the agenda when we meet, which makes it a good time to get the ball rolling. They can also contact their Perstorp contact, or me directly."



What you need when you need it

One of our customers had outgrown their storage facilities, which caused logistic problems. On top of this, they also had a circumstantial logistics process with many checkpoints, where the man-hours piled up.

Looking to streamline their operation, the customer started to dig deeper, initiating a dialogue with Perstorp to analyse how they could reduce their total costs, going beyond product and price. For example, was it really necessary for the customer to do all their checking of incoming goods, every time – when Perstorp had already done the same checks when shipping?

After going through the situation together, Perstorp suggested a more flexible logistics solution, specially tailored to the customer's needs. The customer now gets deliveries 24/7. Cutting out the double-checking, they don't have to tie up staff to receive the shipment. They save time and money, and get secure supplies.

Here are four ways that Perstorp can help improve your supply chain:

1. **Setting up specific storage**
 - close to your facility, shortening your supply chain.
2. **Fine-tuning of the product/packaging**
 - adjustments, packaging, special labels or other ways to simplify your handling.
3. **Tailoring the transport solution**
 - for example requirements on the trucks, or dropping trailers to meet space and staffing issues.
4. **VMI (Vendor Managed Inventory)**
 - making sure that you always have product in stock. You only pay for the quantity you use, reducing operating capital.



OUR PLANT OPERATES 24/7 and Perstorp has been proactive in accommodating our requirements. They have arranged for safety stocks to be held locally to cover any issues with short-term deliveries or if hauliers are delayed. There were also several occasions where heavy congestion at the storage terminal delayed delivery to the customer. The safety stocks less than 30 minutes drive from our site solved this.

Strategic Purchasing Manager

Specialist Materials manufacturer



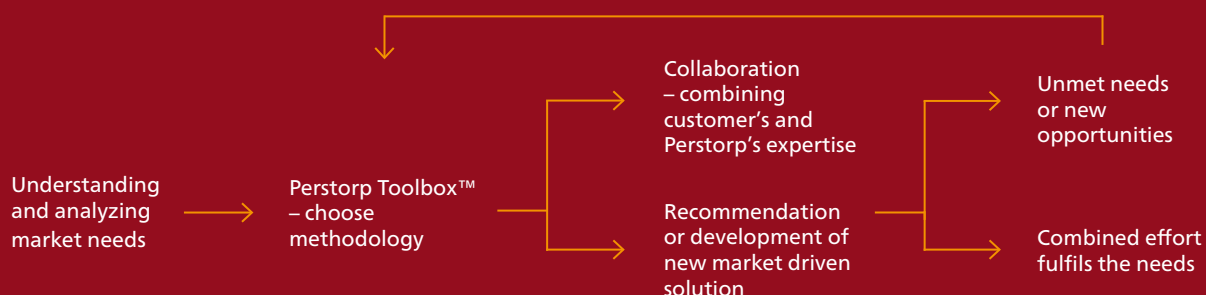
Benefit from Perstorp's support toolboxes

Perstorp has the knowledge and resources to help you with your day-to-day technical issues. This is the basic tier of our support. We can also take it to the next level where we together with you go deeper to develop new molecules that exactly meet your needs and your customers' needs.

TECH SUPPORT



INNOVATION SUPPORT



PERSTORP HAS THE BROADEST polyol offering available in the market, but we still couldn't find a spot-on match for our requirements. We challenged them, looking for a different viscosity profile to improve the end-properties of the specific ester we were discussing. In a joint development project, Perstorp tailored a product that absolutely meets our needs. Their solution has even reduced handling in our production facilities compared to other solutions!

Global key customer

Synthetic Lubricant segment



Give your products a competitive edge

OUR VALUE CHAIN is affected both by macro trends and trends that are more industry specific. Whether it is globalization, demographic changes or increasing environmental awareness, these are things that we all must relate to.

Globally, we also see a shift towards more complex and high-grade products and solutions.

This opens up doors to several new ways that you can differentiate your product portfolio. But also to find new market niches and positions, such as a sharpened sustainability profile and biodegradable products.

At Perstorp we are serious about identifying and understanding trends. Working through the value chain, we network, attend conferences and meet with customers and their customers. We listen and bring what we learn back to the drawing board.

For you, as our customer, this means that we work hard to identify solutions that will meet both your short-term and long-term needs. If you want to develop high-performance, highly stable lubricants, you can rely on our insights in combination with our broad chemistry platform and high technical competence to come up with the right solution.

Again, collaboration saves time and money. Translating trends and how they affect your and other customers' situation into cutting-edge polyols or acids can only be achieved through close dialogue. If we combine our innovation capabilities, the results will improve compared to if we work separately. It will give you a head start, and it will give you an opportunity to make your product portfolio stand out from the competition.



Martina Håkansson
Project Manager Innovation

Innovate to increase savings

Recently, the price for C8/C10 acids has increased. Their availability depends on the production of palm kernel and coconut oils, which is driven by the demand for their dominating acids (C12 and higher). These acids are predominantly used in detergents. The C8/C10 content is low, leading to an undersupply, which drives up the price. The increased use of C8/C10 acids in energy drinks also competes for these acids. The C8/C10 acid shortage is believed to be long-term.

"By investigating and understanding the physical properties of these polyol esters, we are able to offer alternative formulation guidelines, based on less expensive and more readily available raw materials," says Martina Håkansson, Project Manager Innovation. "We closely follow the market trends and customer needs, so we can offer solutions to specific challenges. These solutions have a solid base in our knowledge of how the raw materials can be combined to make esters with tailor-made features."

This can be combined with Perstorp's Virtual Lab tool, which can be used to indicate parameters such as polarity. It also provides a tool to help understand how the ester will work together with other components in lubricants. This adds to our previous knowledge of viscosity.

Your opportunity to get ahead

ONE WAY OR ANOTHER, environmental concern has come to affect most areas of our lives. New reports regarding the climate issue are published continuously, emphasizing the gravity of the situation. A huge transformation is needed to turn things around to make the future more sustainable. And this involves everyone – from nations to companies to individual human beings.

Today, companies across an increasing number of industrial sectors, including those using synthetic lubricants, work hard to reduce their environmental impact. Taking the entire life cycle into account, turning to renewable raw materials and changing to biodegradable products are ways to reduce your carbon footprint and to minimize waste.

For sure, this is about your company's survival, but ultimately it is about taking long-term responsibility throughout the entire value chain as well as in society. Acting responsibly is good for the environment, but it is also good for you – and your customers' businesses. It will add a competitive edge if you are the first one in your sector to do it and the first to fulfill vital needs in the market.

Perstorp takes its environmental responsibility very seriously. To meet the growing demand for products that align with increasingly stringent requirements, Perstorp's R&D department is developing products with sustainability advantages, such as Voxtar™.

The company offers polyol ester raw material with sharpened sustainability profile, and can support customers that want to develop partly renewable polyol ester base stock or polyol esters with significantly lower carbon footprint.

Synthetic esters are a better choice, both environmentally and technically, minimizing environmental impact as well as maximizing performance. Taking the end product's entire life cycle into account; Voxtar™ based esters reduces carbon footprint significantly. For example, one of Perstorp's key customer has calculated that they will save a startling 10,000,000 kilograms of CO₂ per year by turning to Perstorp green polyols.

Collaborating for sustainability gains

AN INCREASING NUMBER of Perstorp's customers are looking for renewable synthetic ester raw materials. "Some of them are setting very tough sustainability targets, and are way ahead of their competitors," says Anna Berggren, Business Development Manager.

Not to be outdone, environmental responsibility is one of Perstorp's top priorities. "As a chemical company, we must contribute to a more sustainable society within the resources of the planet," Berggren says, pointing out that Perstorp currently has several internal sustainability initiatives running, covering both overall strategies and the day-to-day operation. "Part of these initiatives is to collaborate with our customers to advance environmental issues. We want to support them and be their partner in their sustainable development as well as help them to fulfil their own ambitions and to meet demands on sustainable solutions downstream in the value chain."

Apart from supplying more sustainable products and solutions, Perstorp also offers services and support that go beyond products, Berggren explains: "Collaborating with our customers on sustainability matters, we want to inspire and to challenge depending on the customer's individual needs. We also want to share experience and knowledge, help identify needs downstream in the value chain as well as collaborate on joint development projects."



WE SAVE 10,000,000 kg CO₂ emissions per year by using Voxtar™ in our ester production.

Key Customer



SUSTAINABILITY



Voxtar™ pure advantage

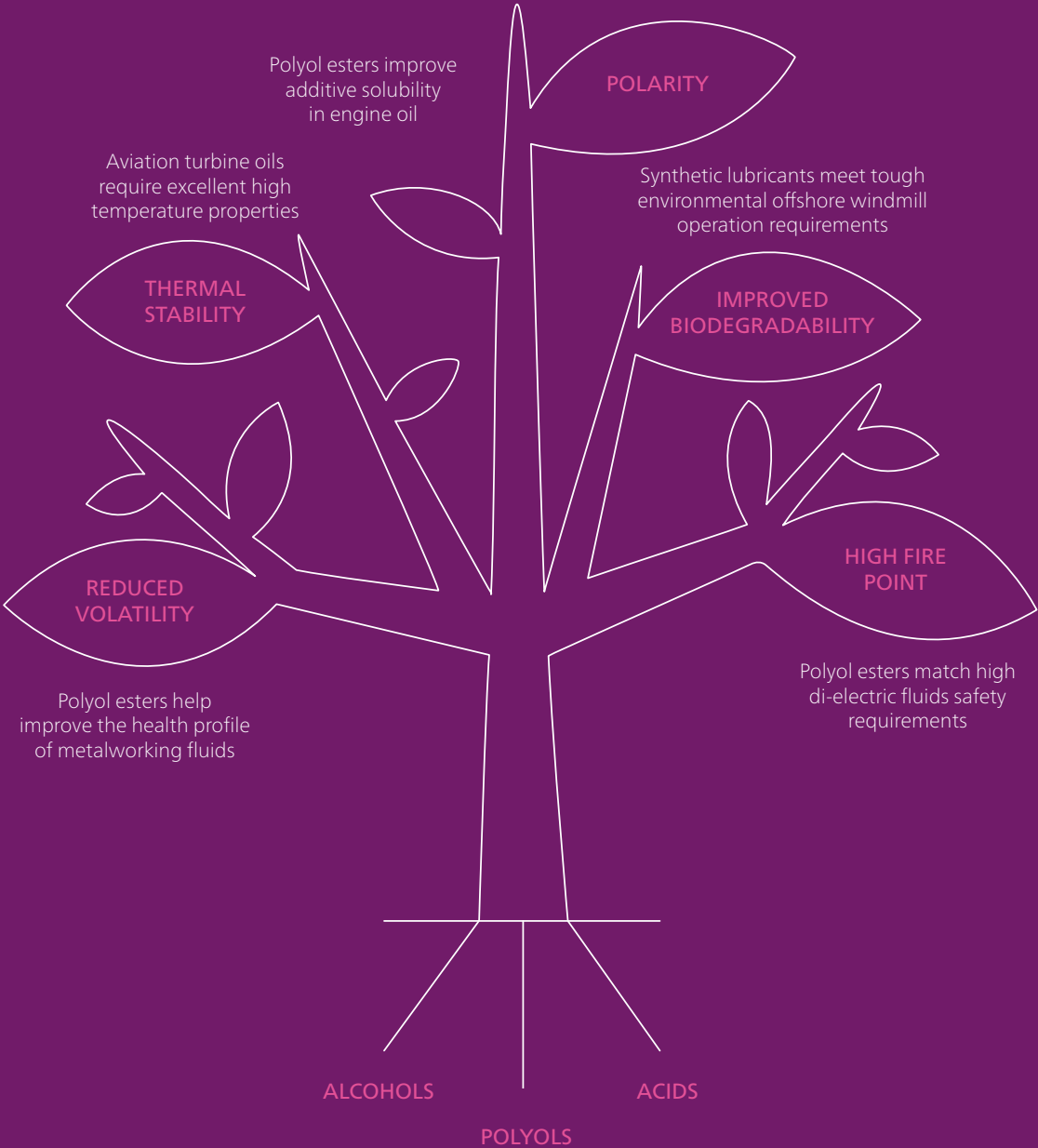
Voxtar™ M50 and M100 are the world's first renewable Penta products. Perstorp introduced them to meet the growing downstream demand for "green" products. Based on the trusted efficiency, security and high performance of Perstorp's traditional Penta, Voxtar is a perfect, sustainable fit. Voxtar™ products give you the same high performance, but in a product that minimizes negative impact on the environment.

Changing to Voxtar™ is an opportunity for you to:

- Differentiate and extend your products
- Meet growing demands for products with outstanding sustainability advantages
- Minimize your environmental impact, while maximizing performance
- Cut your carbon footprint by up to 80 percent
- Source sustainable raw material

PRODUCTS THAT MEET END-USER NEEDS

NO MATTER WHAT the industry, Perstorp can supply core raw materials for producing synthetic lubricants with just the right properties to meet the end-users', often very tough, requirements.



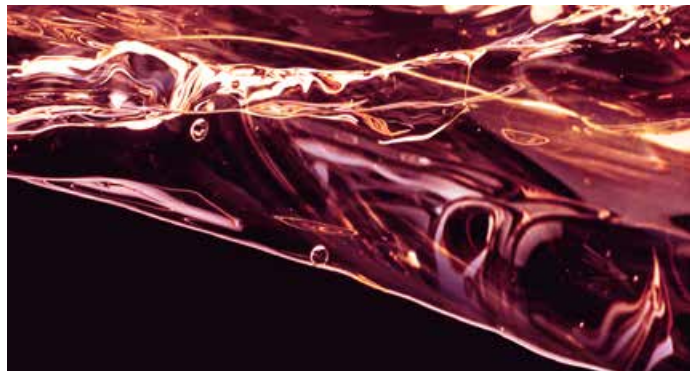
Benefit from a one-stop shop product portfolio

MAKE NO MISTAKE. We are still as proud and committed to our products as ever. Our business may be going through fundamental changes, but our products and our expertise are a solid foundation. You can rely on us to expand our capacity to match the market needs, so you never risk running out of core raw materials.

Perstorp's leading product portfolio includes polyols and acids for ester production. When our competitors are pulling out – we expand and invest. Our comprehensive offer includes a complete product portfolio of neopolyols such as Pentaerythritol (Penta and Penta Excetec™) and Di-Pentaerythritol (Di-Penta). We also offer carboxylic acids, such as 2-Ethylhexanoic acid and Valeric acid as well as polyols, such as TMP, Neo and our renewable penta product, Voxtar™.

These are a great match for ester manufacturers targeting, for example, refrigeration oils/lubricants, transformer oils/dielectric fluids and aviation turbine oils, but also the hydraulic and metalworking fluids markets.

Our products are the building blocks that let you customize solutions with the specific properties that you – or your customer – demand, such as low viscosity and volatility, and high fire point. Backed by our knowledge of what our products can do, how they react with each other and with other products, we can help you take your solutions to the next level.



PERSTORP'S STRENGTH as a supplier is their long-term strategic view of our demands and the prioritization that they make to keep us supplied with high quality products, no matter the lead time or market condition.

Procurement Director

One molecule can change everything

Perstorp believes in improving everyday life – making it safer, more convenient, more fun and more environmentally sound for millions of people all over the world. As a trusted world industrial leader, our innovations provide essential properties for products used every day at home and work. You'll find us everywhere from your car and mobile phone to towering wind turbines and the local dairy farm. Simply put, we work to make good products even better.

Perstorp's focused innovation builds on more than 135 years of experience, representing a complete chain of solutions in organic chemistry, process technology and application development. Manufacturing is based in Asia, Europe and North America, with sales and support in all major markets. The Perstorp Group is controlled by funds managed and advised by the European private equity company PAI partners.

For more information, visit perstorp.com