TERVAKOSKI NEVVS

TAILOR-MADE SOLUTIONS **FUTURE GROWTH IS FUTURE-PROOFING** THAT MEET CUSTOMERS' **BUILT ON TODAY'S** RENEWABLE ENERGY

FOUNDATIONS

NEEDS

WITH ADVANCED HVDC CAPACITOR FILMS

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BUILDING THE FUTURE FOUNDATIONS

Year 2025 has been yet another successful one for Tervakoski Films Group and our customers. Demand in our key segments is growing rapidly, and our customers are setting ambitious targets that match this momentum. We are growing alongside them with a shared commitment to maintain reliability, innovation and long-term partnerships.

Growth does not happen by chance. Our growth is built by our motivated staff in Slovakia and Ukraine, and it is based on trust and deep collaboration with our customers. Over the years, these relationships have evolved into true partnerships where our staff's technical expertise meets customers' needs. Together we push boundaries and create goals that are both bold and still achievable. Our five-year strategy set the goal to double our size by 2029, and we are well on our way.

To secure future growth, we have made the largest investments in our company's history to expand production capacity across our operations. This ensures that we can meet rising global demand, especially in the fast-growing HVDC segment and e-mobility. At the same time, our processes are perfected to keep quality consistent at every stage, even as production expands.

None of this would be possible without our people. Their professionalism, dedication and resilience, even in war-torn Ukraine, drive our success every day. I am amazed and moved that our Ukrainian colleagues can meet and surpass their production figures even in those circumstances. Security of our staff is my main priority and we take it seriously.

These topics are also covered in this year's magazine articles. I hope that you enjoy reading Tervakoski News.





Markets on the rise

Global trends are clear: electrification and decarbonisation are reshaping energy and mobility. HVDC projects, particularly wind power, are multiplying worldwide.

"In the big HVDC projects we are the global market leader when it comes to the film supplies," notes **Jari-Pekka Nurminen**, CEO of Tervakoski Films Group.

At the same time, e-mobility and the automotive industry are driving the growing need for ultra-thin, high-temperature capacitor films, like Tervakoski Film ECU. Public transportation, traction and industrial infrastructure also depend on the most reliable films to ensure uninterrupted operation. In every industry case, failure is not an option — the cleanest raw materials, precise processes and uncompromising quality are non-negotiable.

Still, growth doesn't come easy. It needs meticulous work in every part of the process, every day, in every task. By covering the whole supply chain from raw materials to metallising our own films, we have been able to fulfill all of our customers' needs. The focus on details – meeting and exceeding the expectations set to us – has made our products the synonym for quality and trust.

Investing for tomorrow's healthy growth

To secure future growth, Tervakoski Films Group has invested more than ever in modern machinery. The new LISIM production line in Svit, Slovakia, the first of its kind in Europe, will bring more capacity and flexibility to production. Together with new metallisers and slitters, this represents the largest investment cycle in the Group's history. "All of our lines are the newest in Europe — even our oldest is newer than the competition's newest," Nurminen explains.

"Over the next five years our goal is to double our size, and increasing our film production and metallisation capacity is key. With our new investments, we are well on our way towards this goal."



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People behind the progress

Advanced technology is only part of the story. Tervakoski Films Group's strength lies in its professional and dedicated teams across Slovakia and Ukraine. Despite challenges in recent years, their commitment has delivered record production figures.

"Compromising over quality is not an option with us and everyone of our staff owns this ideology. We research, develop and test relentlessly to be even better — maybe that is one of the reasons we have been able to grow," Nurminen reflects.

From renewable energy to electric transport, global demand for quality capacitor films will continue to climb. With investments in modern machinery and the highly skilled workforce, Tervakoski Films Group is prepared for steady, sustainable growth well into the next decade.



Filtering: HVDC converters generate the harmonic noise during the operation, which can distort the voltage and current waveforms with a subsequent degradation of the quality of transmitted energy, thus also creating risks for HVDC network components. Filter capacitors eliminate these harmonics and this way maintain power quality and reduce losses of transmitted energy.

Reactive power management: Depending on the HVDC system architecture capacitors need also to contribute to reactive power compensation which is one of the necessary parts of the quality energy transfer.

Applications - Tervakoski Film capacitor films in HVDC systems

The power capacitors used in the grid structures are required to be the highest quality, providing excellent durability and reliability to ensure the safe electric network functionality over decades.

Film capacitors are the preferred technology for HVDC applications due to their combination of reliability, performance and safety features. Modern HVDC systems primarily use metallized polypropylene film capacitors, which offer alongside other aspects a crucial safety advantage through their self-healing property. This feature allows the capacitor to continue functioning even after minor breakdowns, significantly enhancing system reliability and safety compared to older oil-impregnated designs.

Tervakoski Film's metallised capacitor films proved their safety and extreme reliability in the HVDC installations on a global scale. Our focus is on delivering films that maintain consistent performance under challenging conditions, including high voltage stress and temperature variations. The tools we use to deliver this promise are high quality raw materials in combination with state of the art manufacturing technology and high quality manufacturing process adapted to the specific requirements of the films for HVDC applications.

Our capacitor films support HVDC transmission systems across various energy sources:

Power transmission networks: Our films are used in HVDC systems that form the backbone of modern power grids, connecting energy sources to consumption centers across long distances.

Renewable energy integration: Whether for offshore wind farms, large solar installations, or hydropower projects, our capacitor films help ensure stable and efficient power transmission.

Grid interconnection: HVDC systems using our films help connect asynchronous grids and strengthen existing power networks.

The future of capacitors in HVDC systems

As HVDC technology continues to evolve, capacitor requirements are also changing. We can identify several challenges that capacitor films are likely addressed by engineers working on the evolution of the HVDC systems:

Higher energy density requirements: System designers are continuously working to reduce the size and weight of components, driving the need for capacitor films that can safely store more energy in smaller volumes. That goes hand in hand with the need to withstand increased voltage stress across the layer of capacitor film.

Temperature stability: The potential adoption of wide bandgap semiconductors (such as SiC-based components) may introduce higher temperature stress, requiring films with enhanced thermal stability. In a similar way, the need for additional cooling of capacitors might need to be revised when using the capacitor films capable of withstanding higher operating temperatures.

Enhanced reliability: As HVDC systems become more critical to power infrastructure, the demand for even greater reliability and longer service life is permanently increasing.

Tervakoski Films Group invests in continuous development to respond with the film performance to the challenges and meet these evolving needs. This commitment to innovation ensures that our films remain at the forefront of HVDC capacitor technology while maintaining the highest standards of safety and reliability.





TAILOR-MADE SOLUTIONS THAT MEET CUSTOMERS' NEEDS

From an old smaller laboratory to today's combination of multiple R&D laboratory testing facilities, Tervakoski Films
Group's in-house R&D laboratory has become the beating heart of innovation and co-development. Its wide technical capabilities and staff's relentless drive for improvement mean that customers receive more than capacitor films – service, which provides answers and confidence that ensure long-term partnerships.

From humble beginnings to unique expansion

Tervakoski Films Group's research and development department has grown steadily over decades. What started as a small laboratory in Tervakoski, Finland during the last century, has evolved into a comprehensive development center. The R&D laboratory has evolved significantly especially after the relocation of headquarters to Svit, Slovakia in 2010.

Today, its facilities offer one of the most sophisticated testing laboratories for capacitor films' needs. It covers the full spectrum from actual DC dry applications but also traditional AC impregnated films, operating with demanding high-voltage stress tests. The lab is equipped with more than ten different aging testing cells for long endurance tests to provide thermal testing from freezing -50°C up to 150°C ultra-high temperatures.

A lab with uncommon capabilities creates agility

The highly experienced staff operating the various and specific laboratory devices enable Tervakoski Film products to pioneer the industry. The laboratory produces consistent development of new capacitor films, helps to create tailored samples for customers and provides material analyses, mechanical and optical measurements and the most critical electrical performance tests.

"Having our own full-scale testing laboratory allows us to perform special quality measurements on films, such as Dissipation Factor (tan \eth) at different frequencies, which are not possible in a production environment and require a protected environment and extra knowledge. And also long term electrical testing on capacitor elements – same as our customers perform which is critical also from a safety point of view," explains R&D Manager at Tervakoski Films Group **Rasto Veles**.



This broadness of variety also means agility. Customers require deeper insights into performance under new stresses, and the lab adapts continuously. A lot of new application requirements have been needed to adopt during the past years, ranging from metal content material analyses, up to insulation resistance, which is measured also on the capacitor elements. Advanced optical scanning methods make it possible to evaluate films with precision, while breakdown strength measurements at a broad temperature range and long-term aging tests ensure that films meet real-world demands.

Where innovation meets patience

Over the years, the laboratory has become synonymous with new product triumphs. Among the most recent is Tervakoski Film ECU, the revolutionary ultra-high-temperature film. Tested in capacitor form for over 200,000 hours, Tervakoski film ECU has set a new industry standard by maintaining performance up to 135 °C.

Tervakoski Film ECU was born originally from customer need and represents a breakthrough product for the automotive sector. The development has been a multi-year journey of co-development, rigorous testing, and continuous improvement, still undergoing long endurance trials today.

"But development is happening simultaneously in all applications. We are continuously working for further development of our well known "state of the art" Tervakoski film ECT for HVDC but also strongly focusing on Ultra Thin Films for automotive applications, where we see a big potential to grow. Now we are able to wind and test capacitor elements ourselves starting from 1,9 μm", Rasto explains.

Accountability during the whole supply chain

Another advantage Tervakoski Films Group possesses is the control of the entire supply chain from raw material to metallisation. Unlike competitors who only handle part of the chain, the Group takes full responsibility for product quality. For customers in heavy-duty applications such as HVDC, automotive or traction applications, this clarity of accountability is a major benefit.





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For customers and partners, the lab's role extends beyond R&D. It is also a guarantee for after-sales support. Capacitors returned with issues are subjected to careful post mortem failure analysis. Thanks to full traceability, the R&D can follow a film's journey from raw-material batch data through film production, its metallisation settings and roll slitting up to capacitors' elements testing.

"Thankfully these situations happen rarely, but our datasets and reports give our customers confidence. We guarantee our reliability and demonstrate our capability not just through promises, but through hard evidence", Rasto notes.

Tailor-made for customer needs

Ultimately, sales and R&D work hand in hand and in perfect harmony. The rising needs from the market feeds the technical development and the technical breakthroughs enable new sales. This cycle ensures that Tervakoski Films Group remains a leading film producer and a trusted partner shaping the capacitor industry's future.

SMOOTHLY RUNNING PROCESSES

- KEEPING QUALITY ON TRACK IN A GROWING ORGANISATION

As Tervakoski Films Group experiences constant growth and expanding production capacity, maintaining consistent quality across all operations becomes both more challenging and more critical. The company combines systematic risk analysis, operator engagement, and data-driven decision making to ensure growth strengthens rather than compromises quality standards.

The foundation of everything

At Tervakoski Films Group, quality isn't just about the final product rolling off the production line. It's involved in every decision, every process, and every interaction throughout daily operations.

"Quality in Tervakoski Films Group has always been a core priority for everyone in every process, product, and activity," explains **Oksana Podolets**, Integrated Management System Manager. "Quality is part of our company culture and decision making."

This becomes especially critical during rapid growth. "If processes and systems are set up correctly, they remain stable and high-quality as operations scale," notes **Martin Kramarcik**, R&D Analyst. "The key is integrating new elements – like new machines or new employees – so they align with the system."

Consistency across growth

At Tervakoski Films Group, the solution for maintaining high quality lies in creating systems that work regardless of scale or location.

"Every production unit and stage has the same rules, routines, and requirements," Oksana emphasizes. "There's no difference whether you're in Lutsk or Svit – Tervakoski Films Group quality always equals one thing: excellence."

This consistency is achieved through "translating to Tervakoski Films Group's language" – taking industry standards and making them practical. "The ISO standards we comply with are translated from dry theory into our language to become understandable and comfortable to fulfill," she continues.

Risk-based thinking in action

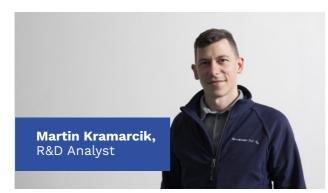
One of the most powerful tools in Tervakoski Films Group's quality arsenal is comprehensive risk analysis through FMEA (Failure Mode and Effects Analysis). This systematic approach to identifying potential problems before they occur has been implemented across every corner of the organization.

"FMEAs cover every part of our company," Oksana says. "At first, meetings felt endless – so many potential hazards and effects were identified."

To see risks clearly, employees often need to shift perspective. "It requires looking at everyday processes from a slightly different angle," Martin adds. The collaborative approach has benefits: colleagues from support functions often spark new ideas by questioning neighboring processes.

Operators as quality champions

Perhaps the most distinctive aspect of Tervakoski Films Group's approach is how quality responsibility is distributed throughout the organization.





Rather than relying on a separate quality control department, the company has empowered its operators to be the primary guardians of quality.

"It took me some time to get used to the fact that the main 'inspectors' in production are the operators themselves," Martin admits. "The quality of the product is, in a way, their signature."

Those closest to the work often know best what can go wrong and how to prevent it. "We don't have a separate quality department – our operators hold that responsibility," Oksana explains. "They have clear specifications and procedures to catch non-standard cases early. We trust them because they are competent and committed."

"When operators take steps to make their daily work easier or safer, they're helping to improve the processes," he notes. "Their knowledge can make a huge difference."

Data-driven growth

Modern quality management relies heavily on digital tools and data analytics for real-time decision making and continuous improvement.

"No successful company can operate today without proper data analysis and digital tools," Martin states. "Statistical software is especially helpful: what used to take hours of manual work can now be completed in minutes, complete with reports."

"With a properly set up measurement system, data always shows the true picture," he continues. This data-driven approach applies not only to targeted improvement projects but also to ongoing processes, helping identify root causes and reduce waste.

"As we continue expanding, our focus is on sustainable development," Oksana highlights. "Growth must align with quality standards – not just focus on increasing customer numbers."

Looking ahead

This systematic approach has built a strong foundation for future growth while maintaining the standards customers expect. "A smooth-running process, to me, is one that is both stable and measurable," Martin reflects. "The real strength lies in the fact that data shows us quality is consistently at the level we expect."

The company continues to invest in both people and technology to maintain its quality leadership. "After major projects, we communicate lessons learned, which improves future processes and maintains quality," Oksana notes. This ensures that as Tervakoski Films Group grows, its quality foundation grows stronger as well.

The result is an organisation where quality isn't just preserved during expansion – it's enhanced by it. For customers, this means reliable processes, consistent standards, and confidence that every product meets the same high expectations.



Mastering the maze of taxation

The main focus of Hricova's work responsibility is taxation, along with accounting and the registration of the company's fixed assets, contract records, and insurance matters.

The dynamic and ever-evolving nature of VAT makes the work both challenging and rewarding. Keeping up requires not only technical expertise but also the ability to interpret legal rulings and apply them effectively in real-world business contexts.

"This is a never-ending process of learning, as laws are frequently amended, and new guidelines and instructions are issued. VAT is one of the most complex tax agendas and is often the subject of tax audits. It is particularly challenging due to frequent legislative changes, various regimes, and exceptions. This is what I enjoy about my work," Dana Hricova explains.

From public service to the private sector

Dana Hricova's career began in public administration after graduating from the University of Economics in Bratislava. Hricova belongs to the generation that witnessed and supported the Velvet Revolution in 1989.

"I believe that our generation, which experienced life both before and after the revolution, has an advantage – we had to be proactive if we wanted to succeed. We know how to orient ourselves quickly and aren't afraid of change," she explains.

With a degree in Systems Engineering, Dana Hricova first worked at the Tax Office in Poprad, gaining deep insight into tax audits and corporate income tax for large companies. She later transitioned to a municipal economist role. This background laid a strong foundation in responsibility, analytical thinking, and adaptability – qualities that would later prove invaluable in the private sector.

A bold shift into industry

Joining Tervakoski Films Group marked a major turning point. Moving from the public to the industrial sector offered her a chance to apply her expertise in a more dynamic and international environment.

"I have never regretted joining Terichem Tervakoski. I saw it as a great challenge – the environment was multicultural, more dynamic, faster-paced, and more complex than what I was used to. At the same time, it was an opportunity to learn new things, advance professionally, and gain experience in the private sector. But I enjoy challenges," Hricova says smiling.

Witness to transformation

Over the years, Tervakoski Films Group has evolved from a regional producer into a global leader in dielectric films. Alongside technological advancement, the company has made significant progress in digitalization, internal communication, and organizational development. While earlier days when the company was smaller may have felt more personal and informal, the structured approach of today supports growth and long-term sustainability.

"Thanks to this, the company is now even better equipped to respond to customer needs and the everchanging industrial and economic landscape."

"Overall, I view the company's development positively – it is growing, modernizing, and at the same time retaining values that matter to people: stability, fairness, and good interpersonal relationships," Hricova says.

Long careers aren't an exception – why do people stay?

Tervakoski Films Group is well-known for its employees' long careers. Dana Hricova is a living example of this company culture characteristic. What motivates employees to stay with the company long-term? According to her, it's a combination of meaningful work, opportunities for growth, and a strong, trust-based culture.

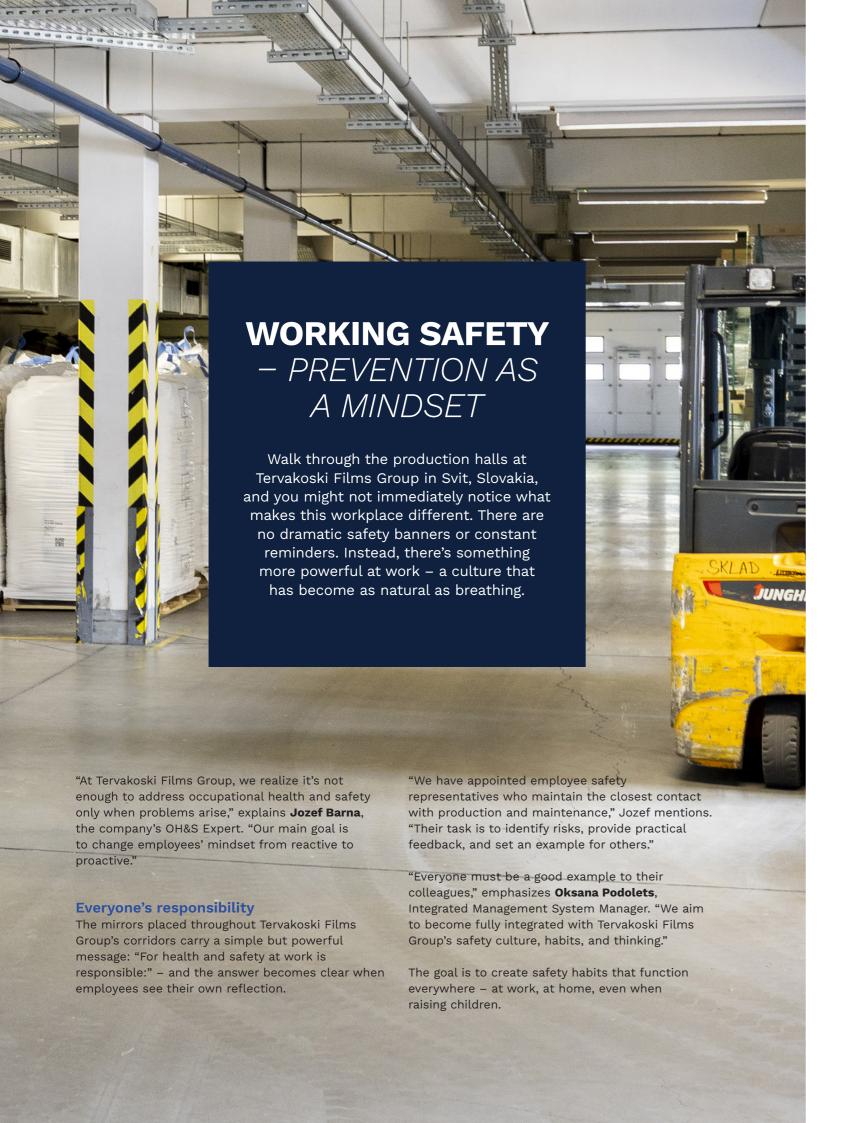
"People stay with a company long-term when they feel their work is meaningful, they are respected, and they have room for both personal and professional growth. Company culture plays a major role."

"Opportunities for learning, development, and career progression are motivating, as is a healthy work-life balance. When a person feels like part of a team and knows their contribution is valued, there's no reason to look for a different job", she sums up.

Advice for a new generation

Dana Hricova's work career might be starting a new shift as a well-deserved retiree, but the respect for her work and persona isn't fading. She wants to leave this advice for young professionals entering the Tervakoski Films Group work community:

"Be curious, open, and don't be afraid of mistakes – that's how you learn. Build relationships, listen to experienced colleagues, and give yourself time. Success is built step by step."



Prevention in practice

The company's proactive approach focuses on systematic risk analysis and near-miss reporting.

"We start every working day with a production meeting where addressing workplace safety is an integral part," Jozef explains.

Recent improvements demonstrate this preventive philosophy in action. The company installed Blue Spot Lights on forklifts throughout the production area. "The light projected onto the floor serves as a clear visual signal, visible from a distance and behind obstacles, giving others time to react even in noisy environments," he continues.

The installation of safety bridges and ropes for employees working in mezzanine areas represents another example of addressing specific workplace risks before incidents occur.

Training that works

Effective safety training goes beyond telling people what to do. "We organize regular training emphasizing that safety is each person's responsibility," Jozef explains. "We encourage employees to communicate openly about issues and develop their own solutions to eliminate risks."

"Our training approach follows a clear process: inform, communicate, practice, receive feedback, and update knowledge," Oksana notes. "This means we have dynamic training sessions. The information isn't dry and theoretical, but 'natural vitamin juice' that continuously shapes our thinking and safety behavior."

Building the future

"At Tervakoski Films Group, our safety culture is strong, thanks to active employee involvement and a proactive approach to prevention," Jozef reflects.

The company's vision extends beyond workplace policies. "We want our employees to behave safely not only in company processes, but to live safely everywhere – safety thinking should become a natural reflex, 24/7," Oksana explains.

"My goal is to move our safety culture toward zero tolerance for risks while improving ergonomic conditions for employees," Jozef continues. "This can be achieved through continuous employee development, integrating safety into every decision, and using innovative technologies."

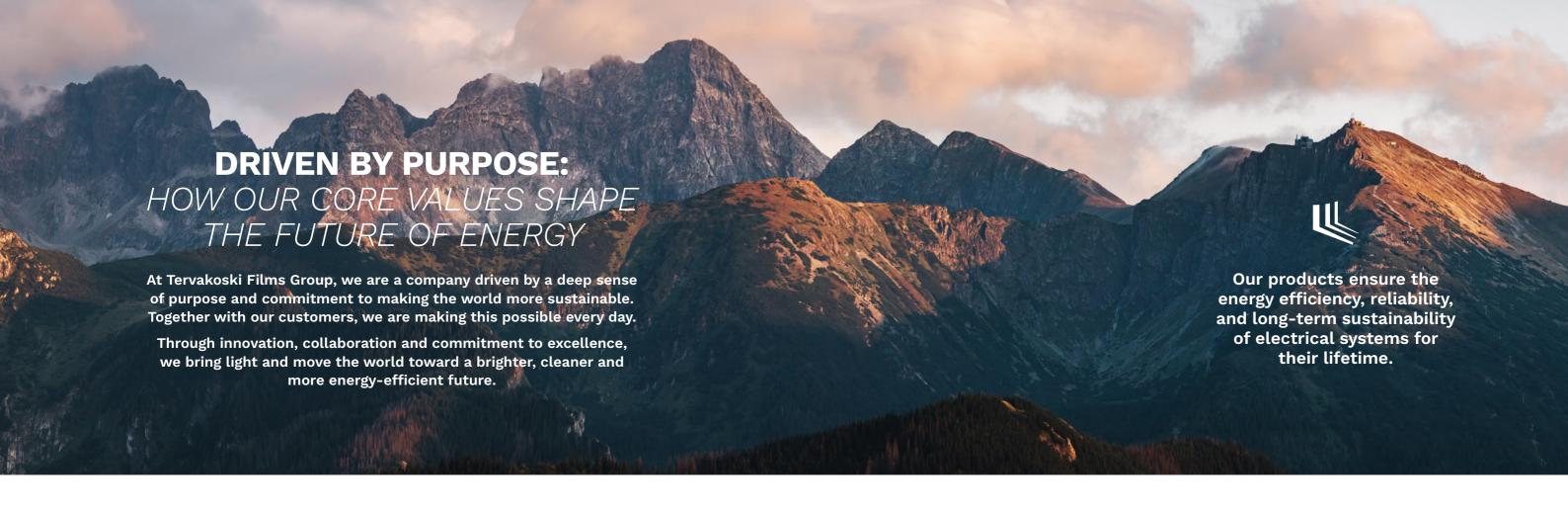




The ultimate measure of safety culture success is paradoxical – the better it works, the less visible it becomes. When safety systems work effectively, they prevent incidents before they occur, creating an environment where dramatic interventions become unnecessary.

"A safe day is a quiet day – and that's our goal," reflects the company's philosophy. For customers and partners, this proactive culture means more than compliance. It ensures reliable operations, committed employees, and confidence that safety is built into every process.

"True safety is when you don't notice it, because it works," That's the standard Tervakoski Films Group has set – and everyone benefits.



Mission: Help the world reduce CO₂ emissions

Enabling a Low-Carbon Future

At Tervakoski Films Group, our mission is to help the world reduce CO_2 emissions. Climate change mitigation is at the core of our business, and we actively contribute to global carbon reduction efforts by providing high-performance capacitor films — one of the key components for capacitor units used in renewable energy distribution, electric transportation, rail, road and naval applications, and industrial and infrastructure applications.

Nosto: Our products ensure the energy efficiency, reliability, and long-term sustainability of electrical systems for their lifetime.

Empowering Renewable Energy

We deliver high-quality capacitor films that enhance the efficiency and durability of large-scale renewable energy systems. Our products are integral to offshore wind farms, where extreme weather conditions and limited maintenance access demand the highest reliability standards. Beyond wind energy, our capacitor films are widely used in solar and hydropower projects, supporting a cleaner and more sustainable global energy mix.

Advancing Electric Transportation

The transportation sector significantly contributes to global CO₂ emissions, accounting for approximately 24% of energy-related emissions worldwide. Road transport comprises about 71.7% of these emissions.

The shift to electrification is a game-changer. Advanced power semiconductors are making electric vehicle (EV) powertrains more efficient, but they also introduce higher operating temperatures and harsher conditions for capacitors. Without heat-enduring materials, onboard systems are at risk of compromised performance.

This is where material innovation plays a critical role. After years of dedicated R&D, Tervakoski Films ECU offers exceptional heat resistance, specifically designed to meet the demanding requirements of modern EVs.

We are also focusing on creating the best performing capacitor films in electric rail transport. Unlike passenger EVs, electric locomotives operate under extreme power loads, long duty cycles, and high mechanical stress. Our capacitor films are engineered to withstand these conditions, ensuring efficiency, durability, and safety in high-performance rail applications.

Through advanced technology and continuous innovation on multiple market segments in cooperation with our customers, we are committed to enabling a low-carbon future.

Vision: Bring the light, move the world

We want to stay on top of the game and create the best possible capacitor films, so that our customers can continue to develop even better products with our products. Through continuous technical development in our chosen application segments, we stay ahead of the curve, pioneering new capacitor film technologies that drive progress toward a more sustainable, emission-free world.

Bringing the light and moving the world — literally and figuratively

Our vision carries dual meanings. "Bring the light" describes our role in electricity distribution as well as illuminating the path that we are on with our customers. "Moving the world" on the other hand, reflects both our ambition to create positive change and our growing presence in the e-mobility sector. By enabling more efficient and compact power solutions, our capacitor films empower e-mobility motor manufacturers to design vehicles delivering superior performance, extended range, and a more sustainable transportation future.

Our core values: The pillars of our success

Our values form the foundation of everything we do: shaping our culture, driving innovation, and ensuring we stay relevant in the application sectors we operate in.

Trust is at the heart of our long-standing success. For over 100 years, we've fostered an environment where people stay, build lasting relationships, and honour their promises. We trust each other, and in turn, we strive to be a trustworthy partner to our customers and suppliers.

Commitment runs deep within us. From our early days as a small company, we've built a family-like culture where everyone is given the opportunity to prosper. We're dedicated to doing our best, supporting one another, and giving back to the community.

Competence fuels our confidence. We know what we do, and we do it with excellence. Our team is focused on creating the high-quality products we are known for, continuous learning and innovation for creating new technologies with our customers. Together, we are not only ready to face challenges — we are inspired to overcome them and deliver superior products to the world.



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