# Revolutionising coatings for wind turbines

Nestled in northern Germany, Bergolin GmbH & Co. KG boasts a rich legacy dating back to 1909, making it one of the oldest coating factories in the country. Initially renowned for its expertise in classical corrosion protection systems and wood coatings, the company has evolved significantly over the years. Today, under the leadership of Managing Director Matthias Otting, it stands as a pioneering force in composite coatings, particularly for wind turbines, with a strong emphasis on durability and functionality.

**PES: Thanks for speaking with us today Matthias. By way of introduction for our readers, could you provide some brief background to Bergolin? You have a history dating back well over 100 years after all.**

**Matthias Otting:** It's great to speak with you. Yes, some company history may be useful to start with. Bergolin was founded in 1909 and is a globally active company, with headquarters in Germany. We specialise in the development and manufacture of high-quality coating systems, with a wide range of products for a variety of applications in the fields of wind power, industry and corrosion protection.

In the 1970s, we were one of the biggest coating suppliers in Germany and as the industry evolved, so did we. Over the past 25 years, we've transitioned to specialising in composite coatings, particularly for wind turbines and marine applications.

The journey hasn't been without its challenges. A significant downturn forced us into a period of consolidation, prompting my own strategic entry into the company. My aim has been to restore Bergolin to its former glory and we have worked tirelessly over the past four years to re-establish our position in the market.

**PES: What outcomes has your hard work produced, particularly regarding your revenue and current market standing?**

**MO:** Despite being a smaller entity, we consistently challenge industry giants with our innovative solutions and unwavering commitment to quality, fuelling our drive for innovation, support, and maintaining exceptionally high standards.

Our focus remains steadfast, with a significant portion of our business concentrated on delivering top-notch solutions that meet and exceed expectations. Over the past four years, we've undergone a remarkable transformation, transitioning from a local supplier to a prominent international player in the blade coating arena.

Today, with a turnover averaging around 22 million euros annually, Bergolin boasts a team of nearly 100 skilled individuals, strategically positioned near major wind turbine manufacturers. This proximity has proven instrumental in providing swift responses to customer needs, particularly in terms of coating application and technical support.

**PES: Fast forward to 2024 then and would you agree that the main focus for you lies in offering the entire package for coating a wind turbine?**

**MO:** When it comes to coating a wind turbine for protection, we offer a comprehensive package, covering every aspect from 'nose to tail'. Over the years, our focus has predominantly been on the blades, given their critical role and intricate coating requirements. With multiple layers serving distinct purposes, our expertise in blade coatings is unparalleled in the industry.

However, our commitment doesn't stop at the blades. We also extend our coating solutions to other essential components, including the tower, especially the concrete towers, which are gaining prominence in the industry. Additionally, we're venturing into new territories, such as providing coatings for nacelle projects, a testament to our innovation and versatility.

One of our recent breakthroughs is the development of a styrene-free gel coat for nacelle manufacturing, which is already making waves with successful implementations. Furthermore, through strategic partnerships, we now offer corrosion protection systems for steel towers, catering to the needs of major players in the market. This expansion enables us to provide a complete package, ensuring quality and reliability throughout the wind turbine's lifespan.

**PES: Bergolin has 25 years of experience in rotor blade coatings of course. How is this leveraged to provide a full system for coating and servicing wind turbines?**

**MO:** With over two decades of experience in rotor blade coating, we have been there from the outset. One of our earliest endeavours was with Enercon, a significant player in the industry. As they flourished, so did we. However, when challenges arose for them, we felt the impact firsthand.

Situated amidst industry giants like Enercon and Nordex, we were at the epicentre of wind turbine production, providing a unique advantage. Our proximity to these manufacturers meant rapid response times. If there was an issue with application or warranty, we were there within hours, not days. This direct involvement granted us invaluable insights into the intricacies of coating application, shaping our understanding of the field.

This close collaboration with manufacturers facilitated a deep awareness of application properties and challenges, enabling us to refine our coatings for optimal performance. It was this proximity to production that fuelled our evolution into a leading authority in rotor blade coating, with pioneering innovations that continue to set industry standards.

**PES: Can you elaborate on the specific range of products Bergolin offers for coating wind turbines?**

**MO:** Our primary focus lies in blade coatings, which form the cornerstone of our expertise. When it comes to blades, various layers serve distinct purposes. Initially, there's a gel coat, although this is not always unnecessary, followed by a range of fillers or putties.

Additionally, we offer diverse topcoat options, including solvent-based, water-based, or even solvent-free formulations. The culmination of these products is our Leading Edge Protection (LEP), a key component in blade coatings.

What sets us apart is our ability to tailor solutions to meet each customer's unique requirements. Whether it's gel coatings, support layers, topcoats, or LEPs, our extensive range ensures we address all customer needs effectively.

Moving beyond blades, our focus extends to the broader realm of wind turbine coatings, including those for nacelle components and concrete towers. For instance, we've developed a ground-breaking solution for the nacelle, a styrene-free system.

Our expertise also encompasses concrete coatings, offering solutions tailored to the demands of construction projects. Additionally, we provide a wide array of atmospheric corrosion protection systems

suitable for various applications. From concrete towers to steel structures, our coatings offer unparalleled protection, even in demanding environments. For instance, our one-layer system for steel towers eliminates the need for primers, simplifying the coating process while ensuring robust corrosion resistance.

**PES: How do you ensure the quality and durability of the coatings, particularly in challenging environmental conditions often faced by wind turbines?**

**MO:** Ensuring the quality and durability of our coatings is paramount, especially considering the harsh conditions wind turbines endure. Environmental factors play a significant role, and meeting the stringent specifications outlined by our customers is imperative.

To achieve this, we've equipped ourselves with state-of-the-art testing facilities capable of evaluating various parameters. From UV resistance to water resistance and thermal changes, we subject our coatings to rigorous testing across a wide temperature range, from -40 to 70 degrees Celsius. In instances where specialised testing is required, we collaborate with renowned institutes to conduct thorough assessments, ensuring compliance with industry standards.

Our commitment to accuracy extends to the testing duration itself. We adhere strictly to specified testing periods, even if it means investing considerable time, such as 5,000 hours. There's no compromise when it comes to the integrity of our testing procedures.

In addition to evaluating finished coatings, we've also intensified our focus on raw materials in recent years. As a chemist myself, I personally oversee this aspect of our operations, underlining the importance of quality assessment from the very beginning of the production process. This dedicated scrutiny has become even more pronounced amid recent disruptions in the global supply chain, particularly during the challenges posed by the COVID-19 pandemic.

Furthermore, our team boasts a wealth of practical experience in the field, complementing our scientific expertise. With a dedicated specialist who spent a decade in blade repair now overseeing this area, we maintain a constant presence in turbine installations, gaining valuable insights into real-world performance and challenges.

This synergy between scientific rigor and hands-on experience informs not only our product development but also our service offerings. By remaining closely attuned to the needs and realities of the market, we continually refine our coatings and services, ensuring they meet the evolving demands of the wind energy sector.

**PES: Do you think that it is this attention to detail and dedication to testing and quality that sets Bergolin apart from its competitors?**

**MO:** We understand the importance of certifications and ensure that our products meet the rigorous criteria set by regulatory bodies. In essence, our offering encompasses not just superior quality coatings but also peace of mind for our clients, knowing that they have a trusted partner providing end-to-end solutions for their wind turbine coating needs.

It's crucial to point out our holistic approach to quality assurance. We don't just focus on laboratory research; we integrate real-life experience and customer feedback into our practices. This comprehensive approach ensures that our coatings not only meet but exceed expectations, providing long-lasting protection and value to our clients.

In essence, our commitment to quality extends far beyond the laboratory. It's ingrained in every aspect of our operations, ensuring that our solutions deliver exceptional performance and reliability in the field.

Dr Matthias Otting

**PES: How do you adapt your products to cater for the changes you see in the field?**

**MO:** As the industry evolves, we're continuously adapting to changes, particularly in after-sales service and retro coating. One significant aspect we've observed is the impact of erosion, especially along the blade edges, a well-known vulnerability in wind turbine operation.

When addressing erosion, we encounter two primary types of protective coatings: rigid and flexible. While flexible coatings typically outperform rigid ones in laboratory tests, our field experience has revealed a noteworthy finding. Rigid coatings, despite their less favourable performance in controlled environments, have demonstrated remarkable durability in real-world applications, with some installations lasting over two decades without significant damage.

**PES: And how does that real-life experience then go on to dictate changes in your products and how you evolve your product range?**

**MO:** Our real-life experience directly influences the evolution of our product range, particularly in terms of quality and processability. We continuously strive to enhance the durability and usability of our coatings to better serve our customers' needs.

One significant aspect of our product development is increasing the durability of our LEP coatings. We've recently developed an innovative product set to launch in the coming months, offering even greater durability than before.

However, our primary focus remains on improving processability to streamline application and reduce costs for our customers. In response to market trends, such as the relocation of blade production to regions with lower labor costs, we've

introduced several advancements to decrease process expenses.

For instance, we've introduced a one-component, water-based topcoat that eliminates the need for a hardener and significantly reduces internal waste. This innovation not only simplifies the application process but also enhances environmental sustainability by minimising material wastage.

Additionally, we offer a two-component system that can be applied in a single layer, providing customers with flexibility in choosing the most suitable application method for their needs.

Our commitment to enhancing processability is driven by the competitive landscape, particularly with increasing competition from non-European suppliers. By offering high-quality coatings that are not only durable but also cost-effective and easy to apply, we aim to remain competitive in the global market.

As the wind turbine industry continues to grow, so does the demand for reliable and efficient coating solutions. Through our ongoing innovation and responsiveness to customer feedback, we are well-positioned to meet these evolving demands and maintain our leadership in the market.

**PES: The global market is important for Bergolin isn't it?**

**MO:** Our achievements extend beyond borders, as evidenced by our establishment of representatives in key markets such as India, the United States, and China. This strategic expansion underscores our dedication to serving a global clientele, with a notable presence in pivotal regions like India and the United States. Additionally, our renewed efforts in Poland signify our commitment to broadening our footprint across diverse geographies.

With sales representatives now stationed in four countries, including two in Europe, our international presence has never been stronger. This milestone reflects our ambition to reach new heights and establish ourselves as a formidable force in the global landscape of blade coating solutions.

**PES: What future trends do you foresee in the wind turbine coating industry, and how are you preparing to address them?**

**MO:** Looking ahead, our focus is on introducing new curing processes to enhance efficiency and reduce production costs. One exciting development is our UV curing system, BergoLED, which drastically reduces curing time from hours to mere minutes, revolutionising field repairs and potentially bringing blade production back to Europe.

We're also exploring opportunities to automate blade coating processes while maintaining quality standards. Our latest innovation involves an infrared reflection system to control temperature variations, particularly beneficial for black coatings designed to deter birds from colliding with turbines.

Moreover, as regulations tighten on environmentally harmful chemicals, we're proactively researching and developing eco-friendly substitutes to ensure compliance with sustainability initiatives like the European Green Deal.

Our commitment to innovation remains unwavering as we strive to address emerging challenges and continue providing cutting-edge coating solutions to meet the evolving needs of the wind energy industry.

**PES: Can we expect to see some such innovations at JEC World 2024 in Paris?**

**MO:** Visitors can look forward to an array of offerings from us. It's our debut at JEC, and we've chosen this platform to showcase our expertise as a comprehensive solution provider for composites, particularly emphasizing our strong presence in blade coating.

At our booth, attendees will discover several solutions tailored for composite applications. We'll spotlight our involvement in significant non-wind composite projects, leveraging our extensive experience in blade manufacturing to make a mark in the broader composite market. Notably, we'll unveil our innovative polyurethane (PU) system compatible with polyester substrates, expanding our reach beyond epoxy-dominated sectors.

Among our highlights will be our UV-curable resin system and a water-based topcoat with LEP-like properties. Additionally, we'll introduce smaller yet impactful innovations, such as an effective anti-icing system and a variety of tactile coatings for gear chords and other components.

Overall, visitors can expect a comprehensive display of our cutting-edge solutions, underlining our commitment to driving advancements in composite technology and meeting the diverse needs of the industry.

**PES: We hope you have a successful show Matthias, many thanks for your time today.**

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