

# Hempablade


Improve wind turbine performance with

Power of **Less**



# Quality is key to optimal performance

In an industry facing significant challenges, quality coatings can make a huge difference in maintaining your blade's performance and overall wind turbine profitability.



The wind energy industry is under significant pressure to increase profitability throughout the value chain. It's a constant race between renewable energy sources to secure efficient, optimal performance while minimising operational costs.

**Blade protection is essential to increasing reliability and efficiency**

Wind turbine blades are continuously exposed to the elements – salt, moisture, sand, UV radiation and temperature fluctuations. That's why it's crucial to ensure your blades benefit from adequate protection to shield them from damage, erosion and degradation.

The condition of your blades affects energy conversion efficiency, therefore choosing the right protection can help operators maintain consistent production levels and reduce maintenance frequency, downtime and operational costs.

# Introducing Hempablade

## Power of **Less**

Better **protection** and **performance** with less material, waste and work

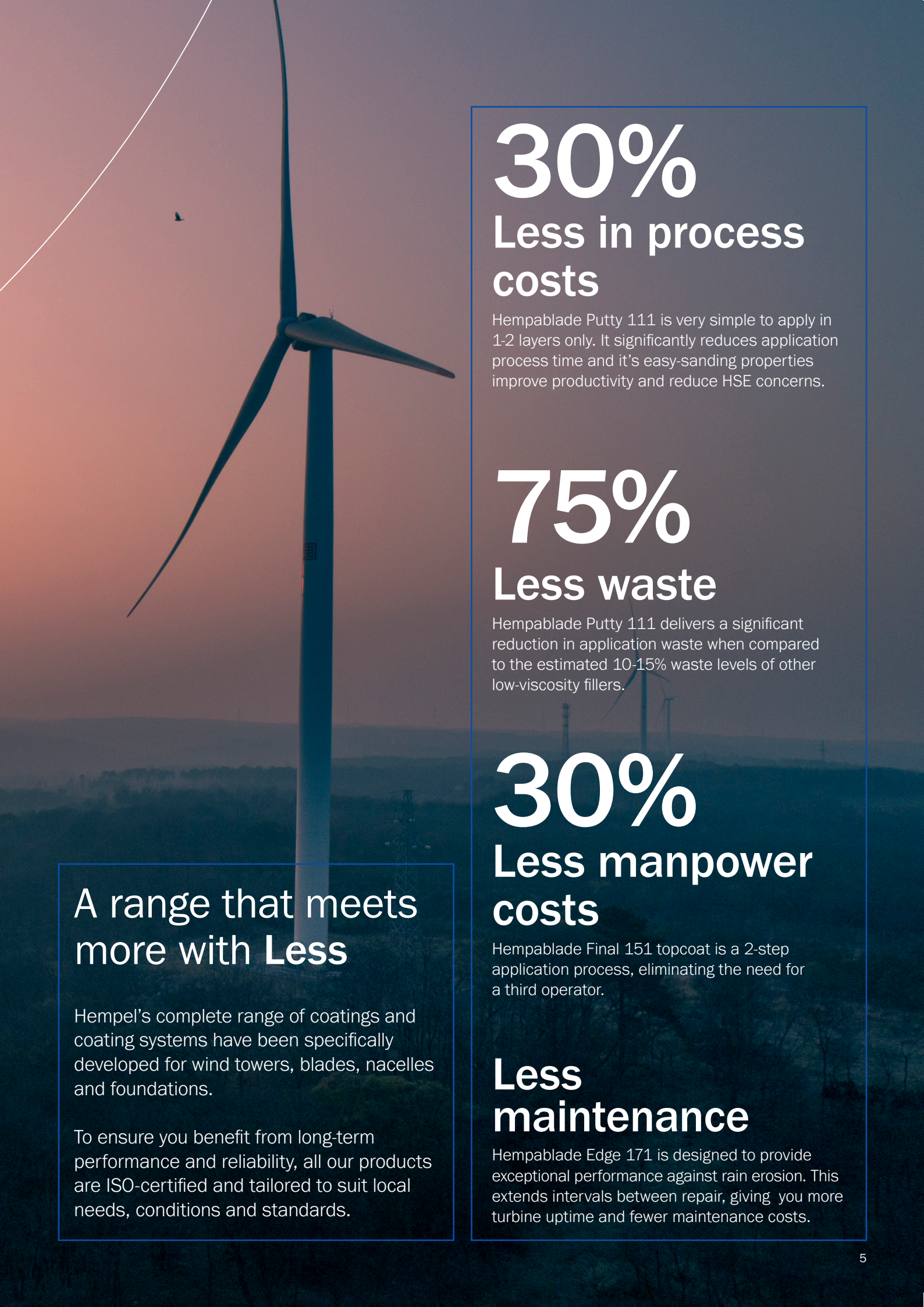
The Hempablade product range of coatings is a full system solution developed especially to protect blades against the ever increasing blade-tip speeds and challenging site conditions, such as erosion caused by rain.

The system consists of an overall blade coating and a robust leading edge protection (LEP) coating. It is designed to support production efficiency, and all coatings fully comply with the highest technical industry requirements.

At a time when application costs frequently exceed the cost of coating materials, Hempablade uses less material and takes less time to apply. From Putty to Filler, and

from Topcoat to final LEP coating, all application stages are optimised to provide excellent performance with less process steps and man-hours, and less coating consumption. As well as helping to optimise your application process, it also improves the blade's leading edge protection and turbine performance with the best Rain Erosion Test (RET) and Dry Film Thickness (DFT) ratio in the market.

At Hempel, we know blade protection requirements may vary greatly depending on a turbine's design, location and other factors, but rest assured that our Hempablade system can accommodate all your needs.



## A range that meets more with **Less**

Hempel's complete range of coatings and coating systems have been specifically developed for wind towers, blades, nacelles and foundations.

To ensure you benefit from long-term performance and reliability, all our products are ISO-certified and tailored to suit local needs, conditions and standards.

# 30%

## Less in process costs

Hempablade Putty 111 is very simple to apply in 1-2 layers only. It significantly reduces application process time and its easy-sanding properties improve productivity and reduce HSE concerns.

# 75%

## Less waste

Hempablade Putty 111 delivers a significant reduction in application waste when compared to the estimated 10-15% waste levels of other low-viscosity fillers.

# 30%

## Less manpower costs

Hempablade Final 151 topcoat is a 2-step application process, eliminating the need for a third operator.

## Less maintenance

Hempablade Edge 171 is designed to provide exceptional performance against rain erosion. This extends intervals between repair, giving you more turbine uptime and fewer maintenance costs.

# The Hempablade coating system

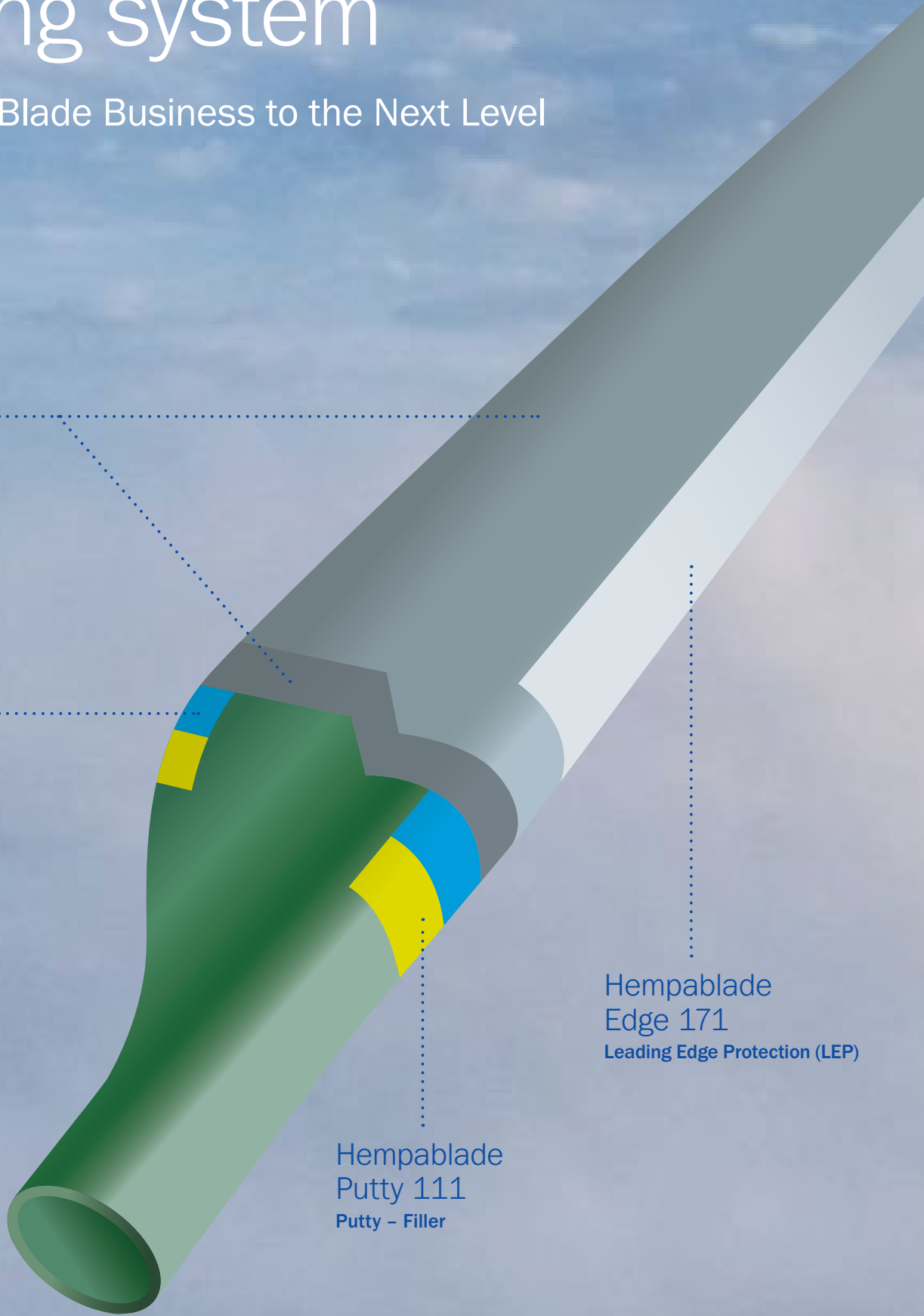
Taking your Blade Business to the Next Level

Hempablade  
Final 151  
Waterborne Topcoat

Hempablade  
Pore 141  
Pinhole - Filler

Hempablade  
Putty 111  
Putty - Filler

Hempablade  
Edge 171  
Leading Edge Protection (LEP)



## Hempablade Putty 111

A fast-curing, solvent-free and light-weight 2-component polyurethane putty that can be used to form edge profiles and fill defects on the surface of the wind turbine's blade prior to finishing coatings or LEP. It offers a combination of a good mechanical properties, easy application and high-build capabilities.

- **High-build 0-8 mm per layer**
- **Pinhole free**
- **Very easy to sand**
- **Ready to sand after app 1-hour**
- **Low density (up to 40% lower) reduces blade loads and applicator fatigue**
- **Highly flexible when cured**

---

## Hempablade Pore 141

A fast-curing, solvent-free, polyaspartic-based porefiller with excellent self properties that can be used to fill pinholes in substrates.

- **Low viscosity**
- **Fast curing within 1-hour**

---

## Hempablade Final 151

A high performance, fast-curing, two-component waterborne polyurethane topcoat for wind turbine blades.

- **2x operator application only**
- **Fast curing within 1-hour**
- **Very low roughness level**
- **Excellent cosmetic appearance**
- **RET performance integrated**

---

## Hempablade Edge 171

A fast-curing top-layer designed to provide best-in-class erosion protection of the leading edge on wind turbine blades. Possibly the easiest application process for any LEP system available.

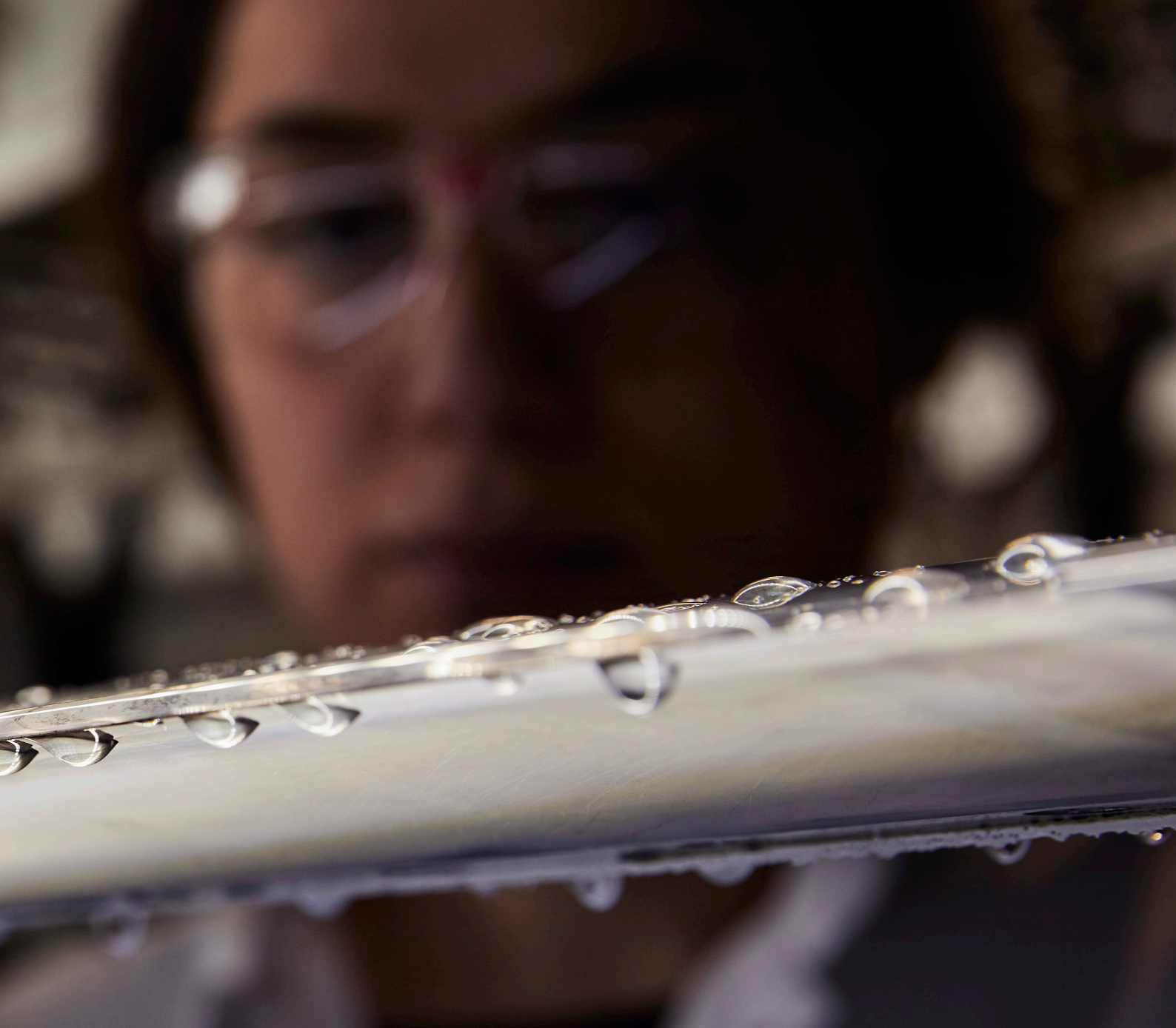
- **1-2 layers only with low DFT**
- **Low consumables costs**
- **No activation/sanding between layers**
- **Wide application window allow for maintenance usage**

A close-up photograph of a metal blade, likely a turbine blade, with several water droplets on its surface. The background is blurred, showing industrial machinery and lights. Two thin white lines cross the image diagonally.

# Less concern with more testing

Benefit from our **in-house test facility**





At Hempel, we have our own in-house DNV GL RP-0171 compliant RET facility. And we've put Hempablade Edge 171 to the test in more than 500 exhaustive test sessions and assessments. This not only ensured the optimisation of its development and the LEP validation process, but it also means you can be sure it is proven to protect against rain erosion

in the toughest conditions. These rigorous tests culminated in a product that extends the intervals between scheduled maintenance, resulting in more turbine uptime and reduced running costs.

# A partner committed to meeting your **coating needs**

Partnering with Hempel means **access to trusted products, services and support.**

Founded in 1915, Hempel is today one of the world's leading manufacturers and suppliers of protective coatings. Our advanced high-performance solutions are used in the protective, decorative, marine, container and yacht industries, while our collaboration with the wind industry began in the 1980s.

From wind turbines and power stations to some of the world's most famous bridges and buildings, our coatings can be found all around the world, protecting valuable structures and equipment from corrosion. In addition to having a complete range of high-performance coatings and trusted technologies when you need them, you will also have access to expert technical service and support to ensure our coatings add real value to your business.

## **Proven performance in the wind energy industry**

Our coating systems are used on many of the world's best-known wind farms. We have been working in the wind industry since 1980, and over the years we have built up extensive experience and knowledge. Our proven track record has resulted in us becoming the trusted coatings partner for wind turbine manufacturers all around the world.

## **An expert team at your service 24/7**

Many of our highly qualified coating advisors and engineers specialise in wind energy production. Their job is to ensure your coating system meets or exceeds expectations. They work closely with you from initial specifications to ongoing maintenance and can visit your production line or construction site to improve efficiency by adjusting application procedures and training applicators.

We are available 24/7 to assist with product implementation, coating process optimisation and on-site troubleshooting. Our multinational coordination teams

work with you every step of the way to ensure that your coating project runs smoothly from start to finish.

## **R&D for a more efficient, productive future**

Our R&D teams are committed to the development of innovative and effective coatings. With local teams situated in key wind energy locations, we can tailor our solutions to your specific needs and local conditions. This approach ensures you benefit from long-term reliability, reduced maintenance costs and high production throughput.

## **Sustainability and Hempablade**

Hempel contributes to the sustainability of renewable energy by offering a full system that significantly extends the lifespan of wind turbine blades, contributing directly to achieving renewable energy goals.

Hempablade Full System helps reduce volatile organic compound (VOC) emissions as it requires less applications to protect the blades. It's a low density system that offers a high level of flexibility. As it has less viscosity and no pinholes, it's also very easy to sand, leading to less applicator fatigue.

## **Wherever you are we are always close by**

One reason why wind industry customers choose Hempel is our extensive global presence. With 8 brands, 26 factories, 17 R&D centres, 359 stores, +250,000 customers and +7,500 employees, we are the proven global supplier of coatings for wind turbine blades.

Uniquely placed to serve the global demands of the wind industry, our global presence ensures supply-chain security for your business. We can deliver high volumes anywhere in the world and tailor our global solutions to meet your local needs.



**HEMPER**  
Trust is earned

Taking your Blade Business to the Next Level with

## Power of **Less**

Take the first step to boosting wind turbine performance with Hempablade.

Hempel Group Head Office  
Hempel A/S  
Lundtoftegaardsvej 91  
2800 Kgs. Lyngby  
Denmark

Tel: +45 4593 3800  
Email: [windpower@hempel.com](mailto:windpower@hempel.com)  
[www.hempel.com](http://www.hempel.com)

