

Leading Edge Protection Upgrade Solutions

Ensure uninterrupted, optimal turbine performance by protecting your blades against harsh environmental conditions

Benefits

- Protect against blade damage and expensive repairs or replacements, decreasing risk of AEP losses from blade erosion or downtime
 - Full suite of upgrade solutions to match specific needs and asset management strategy
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Leading edges exposure to elements

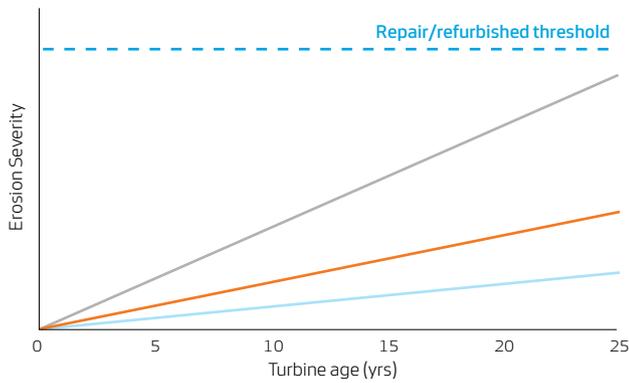
During wind turbine operation, blades are continuously exposed to changing environmental conditions. Over a blade's operational lifetime, this will naturally generate wear and tear leading to the erosion of the leading edge of the blade in particular - depending on the site and project specific conditions. In addition to the visual impact of erosion, deterioration of the leading edge can negatively impact the aerodynamic characteristics of a blade, leading to increased sound and performance reduction. If left unaddressed, it can eventually lead to

structural damage in the turbine, requiring expensive repairs.

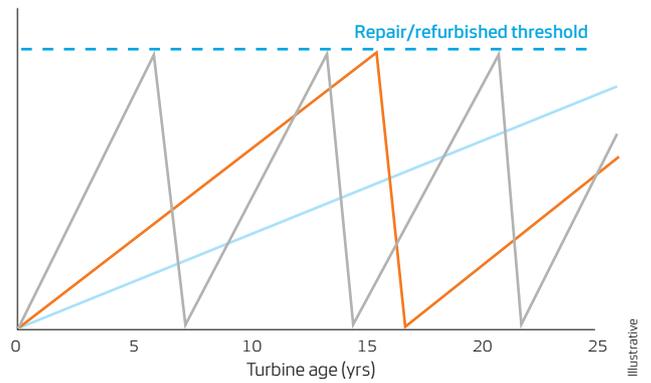
Portfolio of solutions to fit project-specific conditions

Vestas offers a comprehensive suite of Leading Edge Protection upgrade solutions to suit your site-specific requirements and asset management strategy. Paint coatings, tape and shell solutions are all designed to increase resilience against weather and deter erosion at the most exposed areas of the blade. They can be applied across turbine brands and platforms.

Site A - Low Erosion



Site B - High Erosion



A Leading Edge Protection approach is dependent on project-specific conditions and asset management strategy. High precipitation, air moisture, salt, dust, or sand are factors that increase the risk of leading edge erosion.

— Paint coating solution — Tape solution — Shell solution

Illustrative

Application

Paint Coating Solution

All brands and platforms

Tape Solution

All brands and platforms

Shell Solution

Some Vestas and Multibrand platforms*

* Dependent on blade geometry. Contact your local Vestas Sales & Service office for platform and turbine specific availability

Paint Coating Solution

A paint coating solution is recommended for sites with low erosion risk or as a lifetime extension solution for blades with limited remaining operational capacity. It is easily applied, requires little labor and repairs are simple. The coating can be applied uptower by blade technicians via rope access or a blade platform. The polyurethane coating is applied in three layers of 100-125 microns Dry Film Thickness (DFT), usually in different colors to allow for a visual inspection of wear and tear.

Tape Solution

A tape upgrade solution is suitable for sites with moderate erosion risk and provides a good, even layer of protection while offering resistance to punctures and UV rays. The tape can be applied uptower to the outer third of the blade by skilled service technicians, after thorough blade surface preparation. The tape is applied using an adhesion promoter and an application solution that makes the tape cling to the surface. It is then finished off with an edge sealer. The tape is based on an exceptionally tough polyurethane elastomer material, which has been thoroughly tested to ensure high quality and consistent performance.

Shell Solution

A shell solution is especially effective as a longer-lasting solution on highly erosion-prone sites and is designed to provide a strong level of erosion protection. With a limited need for continuous repairs, downtime is kept at a minimum and energy production maximized. The shells are mounted using either a pressure sensitive adhesive tape or a liquid adhesive and can be installed by blade technicians via rope access or a blade climbing platform. Blades require limited repairs prior to installation as the shells are applied directly onto the eroded surface. The shells are made of robust elastomeric polyurethane and specifically shaped to fit the aerodynamic profile of a given blade type.

Get in touch with us today

Visit vestas.com or contact your local [Vestas Sales & Service office](#) to get to know more about how Leading Edge Upgrade Solutions can protect your turbine blades and ensure continued high performance.

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