Blade Performance Upgrades

Tailored, field-proven upgrades that boost efficiency, reduce costs, and extend blade reliability.

Polytech's Blade Performance Upgrades (BPU) have been a cornerstone of our expertise since the foundation of Polytech in 1994. Every year we produce 100.000+ items.

Engineered to meet OEM specifications and build-to-print requirements, BPUs integrate seamlessly with existing blades, delivering validated improvements in structural performance, durability, and total cost of ownership.

As rotor diameters have expanded substantially compared with those from the first commercial turbines and tip speeds approach 400 km/h, the operational boundaries are being redrawn. With new assets designed for 30+ years of production life, the components affixed to these blades face immense physical demands far beyond the assumptions of the past.

Each upgrade ensures precise integration and bond-line integrity, maintaining optimal performance across the full blade system. By combining deep expertise in polyurethane, composites with structural reinforcements and protective solutions, BPUs help operators reduce downtime, minimize maintenance, and unlock additional energy production, even under continuous operation in demanding environments.

Turn page to see our Blade Performance Upgrades portfolio.

THE BENEFITS

- **Performance optimization**
  Material and design optimized components improve airflow, load-distribution, and overall turbine efficiency, supporting increased AEP.
- **Cost efficiency**
  Durable, field-proven materials and engineered solutions reduce unplanned repairs, maintenance intervals, and lifecycle costs.
- **Risk mitigation**
  Targeted protection against environmental wear, lightning, vibration, and mechanical stress ensures long-term operational reliability.
- **Global expertise**
  Trusted by leading OEMs and asset owners worldwide.

Polytech
Wind for life™

Materials engineered for long-term operation

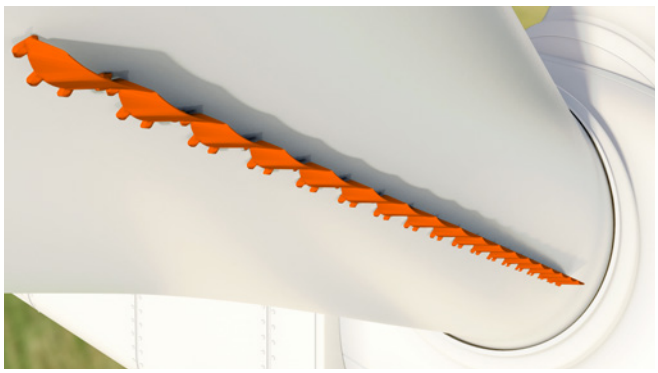
Polytech BPUs are made from advanced composites and high-performance polymers, validated through rigorous laboratory testing and real-world operating conditions. These materials provide exceptional durability and fatigue resistance, reducing maintenance needs while preserving blade structural integrity over decades of service.

Optimized performance across operating conditions

Serrations

Trailing-edge serrations reduce aerodynamic noise, so turbines can meet permitting requirements without heavy curtailment. Using robust, erosion-resistant polyurethane and blade-specific geometries, Polytech serrations lower sound emissions while ensuring durable bonding, controlled tolerances, and long-term interface reliability between serration and blade, supporting higher AEP on noise-constrained sites.

T-spoilers



T-Spoilers are passive load-management add-ons that reduce structural loads with minimal impact on energy production. Installed along selected blade sections, they help lower fatigue and extreme loads on blades, hub, and tower, supporting lifetime extension and more demanding operating conditions without active control systems.

Balancing chambers

Internal balancing chambers enable precise mass adjustment to reduce blade and drivetrain vibrations. Based on a robust, repeatable polyurethane process, they help minimize imbalance, lower fatigue loads on critical components, and improve turbine availability with a compact, integrated solution.

Blade root covers

Blade root covers protect the critical blade-hub joint from moisture, debris, and environmental damage, both during operation and handling. They preserve structural integrity, simplify maintenance, and enhance turbine reliability over its service life.

Collaborate for maximum return

From material selection, design-for-manufacturing and blade integration to validation and installation support, Polytech works closely with customers to ensure every Blade Performance Upgrade delivers measurable improvements in reliability, energy production, and return on investment.

NOTE: Components are orange for clarification only.

Visit **polytech.com** for more information

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