

Coating Systems for Wind Energy

AkzoNobel 



RELEST®

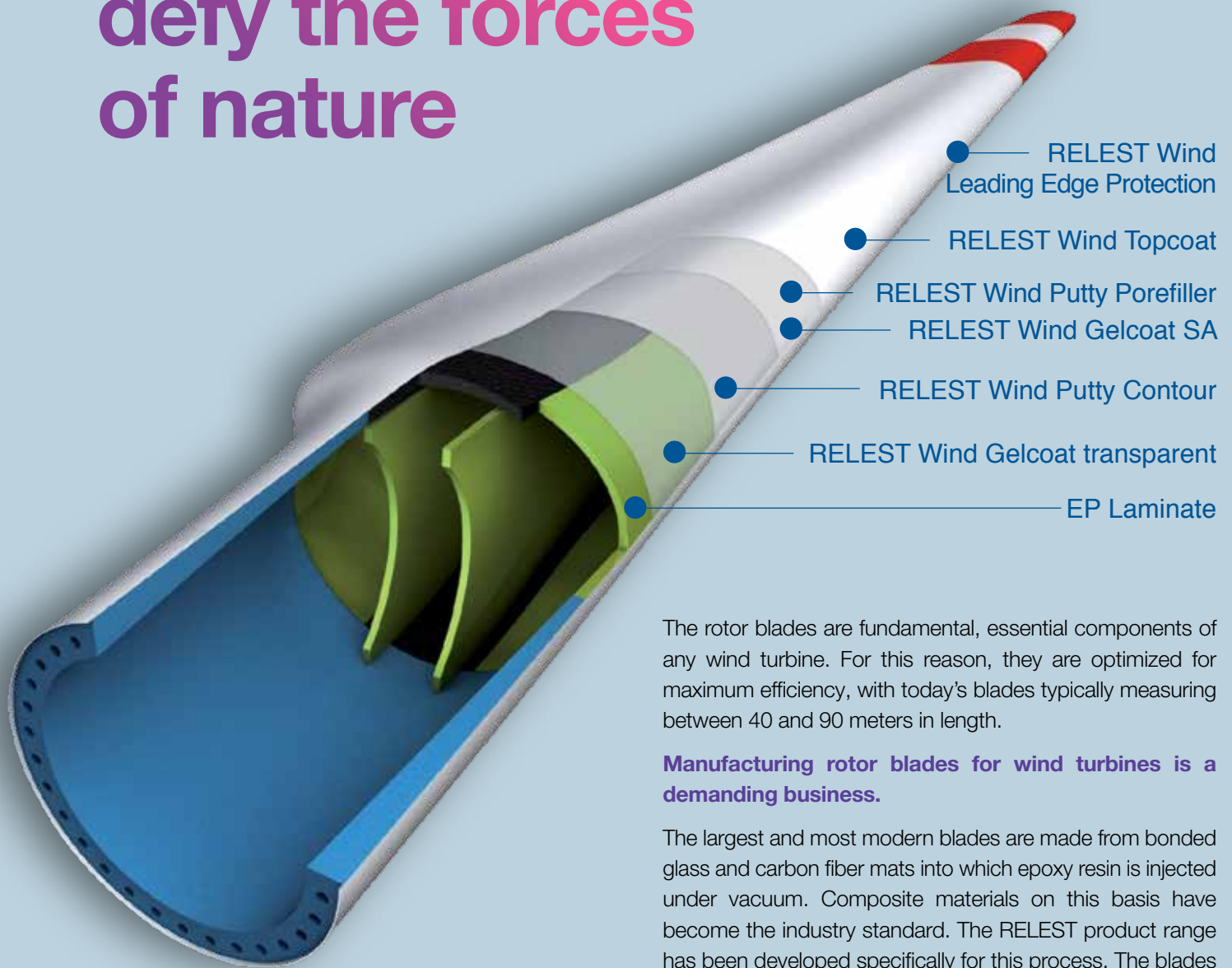


The benefit of working with AkzoNobel

As a result of the RELEST Wind brand having been acquired by AkzoNobel at the end of 2016, our customers can continue to rely on the products they know, from the people they trust, as we continue to deliver innovative solutions to help our customers enjoy a sustainable future for their businesses.

By choosing AkzoNobel as your single source supplier of coatings for wind turbines – from tip to toe – you could drive down costs, increase productivity and ensure consistency. Through its extensive and trusted portfolio of products, AkzoNobel provides the essential protection needed for the whole of the wind turbine, offering a single point of contact and capitalizing on its operations from over 80 countries.

How rotor blades defy the forces of nature



Considering the central role of renewable energies, wind energy has taken on new significance. Intensive efforts are underway to boost its competitiveness with respect to other sources of energy, with turbines becoming increasingly bigger and more powerful.

The rotor blades are fundamental, essential components of any wind turbine. For this reason, they are optimized for maximum efficiency, with today's blades typically measuring between 40 and 90 meters in length.

Manufacturing rotor blades for wind turbines is a demanding business.

The largest and most modern blades are made from bonded glass and carbon fiber mats into which epoxy resin is injected under vacuum. Composite materials on this basis have become the industry standard. The RELEST product range has been developed specifically for this process. The blades are built according to the sandwich construction principle and are stabilized with reinforcing spars and bars on the inside. This high-tech construction technique also provides exceptional stability and flexibility.

The finish consists of multi-layer polyurethane-based coats, with different erosion and UV resistance, depending on requirements. The coatings' excellent adhesion properties minimize the risk of stress cracking. In addition, their flexible behavior prevents them from flaking off, despite rotor tip vibrations that cause them to bend by several meters. Our products thus provide lasting protection for operating times of up to 20 years.

RELEST product range

We have the solution: From gelcoat and putty to topcoat, whatever you are looking for, we have the right offer for you.



RELEST Wind ProcessCoat

- Solvent-free and semi-transparent 2K polyurethane gelcoat for use as in-mold gelcoat with low film thicknesses
- Significantly easier to sand than glass-fiber reinforced epoxy substrates
- Tinted hardener for mixing control - quick visual inspection of the mixing process (manual and automated application)
- Use of the new generation of UV absorbers - temporary outdoor storage of uncoated rotor blades, without the risk of UV light damaging the substrate
- VOC compliant

RELEST Wind Gelcoat transparent

- Solvent-free 2K polyurethane gelcoat for use as in-mold gelcoat
- Significantly easier to sand than glass-fiber reinforced epoxy substrates
- Transparent processcoat - suitable after demolding for checking the rotor blades produced in the vacuum-infusion process
- VOC compliant
- Large application window - offers good flow and fast curing on large surfaces
- Pore-free surface after demolding - can be topcoated without any additional working steps

RELEST Wind Gelcoat SA

- Solvent-free 2K polyurethane gelcoat
- Manual and automated spray application
- Cures fast and is quickly ready for recoating and sanding
- Film thicknesses of 150 - 400µm can be achieved in one working step with optimal flow properties
- Quick visual inspection of the mixing process (manual and automated application)

RELEST Wind Gelcoat RA

- Solvent-free 2K polyurethane gelcoat
- Film thicknesses of approximately 200µm can be achieved in one step with optimal flow properties
- Quick visual inspection of the mixing process



- Very high abrasion resistance
- Outstanding flexibility
- Top level UV resistance
- Environmentally friendly

RELEST Wind Putty Porefiller

- Solvent-free 2K polyurethane porefiller for filling pinholes (of different sizes), visual inspection
- Compatible with all systems
- Recoatable without scuff-sanding
- VOC compliant
- In 2K cartridges for direct application of small quantities
- Quick visual inspection of the mixing process

RELEST Wind Leading Edge Protection

- 2-component solvent-free polyurethane coating gives excellent protection from erosion, sand and water
- VOC compliant
- Supplied in 2-component cartridges for direct application of minimal quantities without weighing
- Good UV and weathering resistance

RELEST Wind Putty Contour

- Solvent-free, highly viscous polyurethane putty for smoothing surface and contour irregularities
- Suitable for manual (3K) and mechanical (2K) application
- Rapid curing - product is quickly ready for further processing and recoating
- Damages of up to 10mm can be repaired in one step, depending on application method
- Quick visual inspection of the mixing process (manual and mechanical application)

RELEST Wind WB Topcoat

- Matt waterborne 2K acrylic polyurethane topcoat for use as finishing coat on rotor blades
- Dries fast and is quickly ready for recoating, even at high film thicknesses without the risk of blistering
- Good UV and weathering resistance
- Suitable for roller and spray application
- Good coverage of sanding scratches

RELEST Wind HS Topcoat

- Matt 2K high solids acrylic polyurethane topcoat for use as finishing coat on rotor blades
- Dries fast and is quickly ready for recoating, even at high film thicknesses without the risk of blistering
- Good UV and weathering resistance
- Suitable for roller and spray application
- Low VOC content (high solids content)
- Excellent erosion protection
- High film thicknesses with good flow properties in one working step

It all comes down to the finish



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One thing all our customers have in common is the drive to design a high quality end product in a way that is economical, ecologically sound and innovative. Accordingly, we offer a product system that combines several different procedures and methods, so it can be adapted to individual production processes.

At present, the most widely used process is vacuum infusion. In this process, two half-shells are charged with release agent. The shells are lined with glass-fiber mats and other reinforcing materials. A plastic film is then used to seal the molds airtight. Afterwards a vacuum pump sucks an epoxy resin and hardener mixture into the mold and into the glass-fiber mats. The blades are then hardened at 70°C (158°F) and the two blade halves are bonded together.

In the next step, the rotor blade can be protected from environmental factors, such as moisture and light by a gelcoat. Small irregularities on the surface are smoothed with the putty. A coating that protects the edges against wear is applied, followed by application of a topcoat in the final step.



- Consistent high level of product quality
- Guaranteed process reliability
- Process-oriented solutions worldwide

We partner with many of the most important rotor blade manufacturers across all continents. However, this also means that our products must function as reliably in the deserts of Arizona as they would in the North Sea, with life cycles of up to 20 years. To this end, the quality requirements for RELEST products depend on multiple factors, including region of use, highly diverse climatic conditions, different application fields, not to mention the fact that rotor blade sizes are changing.

Naturally, quality assurance based on recognized testing methods is a vital factor in this process, but what can be done when there are no established testing procedures? We create our own solutions. This is how the 'helicopter testing device' was developed for use in testing the rain erosion resistance of our products. In this custom-built unit, several coated test specimens are placed on a rotating disc. The entire unit then rotates at up to 500 km/h through a curtain of water drops - for many hours. All coatings must undergo this endurance test.

Minimizing downtime and maximizing time in-service is the objective

Reap the benefits of high-tech systems with:

- High abrasion resistance and elasticity - resulting in optimal protection from sand and rain erosion, as well as stress cracking
- Exceptionally long product life - product cycles of up to 20 years are achieved even under extreme conditions
- Simple, flexible application - whether brushed, sprayed or using robotics
- Individual solutions - you will find exactly the right product for your requirements



RELEST product range

	Wind Process-Coat	Wind Gelcoat transparent	Wind Gelcoat SA	Wind Gelcoat RA	Wind Putty Porefiller	Wind Putty Contour	Wind WB Topcoat	Wind HS Topcoat	Wind Leading Edge Protection
Precoating system									
In-mold process	■	■							
Repair/filling of pinholes					■	■			
Sealant/intermediate coat for rotor blades			■	■					
Surface finish							■	■	
Leading edge protection									■
Automated application									
Repair/filling of pinholes					■	■			
Intermediate coat			■						
Surface finish							■	■	
Leading edge protection									■
Manual application									
Repair/filling of pinholes					■	■			
Sealant/intermediate coat for rotor blades			■	■					
Surface finish							■	■	
Leading edge protection									■
Repair									
Repair/filling of pinholes					■	■			
Sealant/intermediate coat for rotor blades			■						
Surface finish							■	■	
Leading edge protection									■
Properties									
Drying	++	+	++	++	++	++	++	+	++
Sanding behavior	++	+	+	+	++	++	++	+	+
Recoatability			++	+	+	+	++	+	+
Sagging resistance	++	+	++	+	+	++	+	++	+
Cartridge	No	No	No	No	Yes	Yes	No	No	Yes



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AkzoNobel creates everyday essentials to make people's lives more liveable and inspiring. As a leading global paints and coatings company and a major producer of specialty chemicals, we supply essential ingredients, essential protection and essential color to industries and consumers worldwide. Backed by a pioneering heritage, our innovative products and sustainable technologies are designed to meet the growing demands of our fast-changing planet, while making life easier. Headquartered in Amsterdam, the Netherlands, we have approximately 45,000 people in around 80 countries, while our portfolio includes well-known brands such as Dulux, Sikkens, International, Interpon and Eka. Consistently ranked as a leader in sustainability, we are dedicated to energizing cities and communities while creating a protected, colorful world where life is improved by what we do.

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