

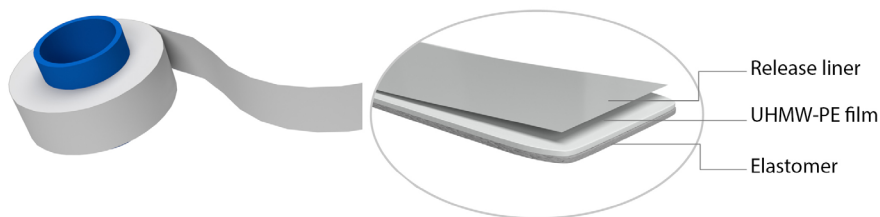
PRODUCT INFORMATION

KRAIBURG LEP

Leading Edge Protection

KRAIBURG LEP is a film for protection against erosion damage to the leading edges of the rotor blades of wind turbines. A quality product which has been developed over the past years and tailored to the requirements of an innovative, highly technical industry.

It is characterized by long-term erosion protection of the blade leading edge of wind turbines while at the same time offering UV protection of the erosion protection film and ease of use during application. The long-term reliability with a high dynamic durability results in low maintenance and repair costs for the windenergy plants. As our material is especially suitable for use in extreme conditions, customers benefit from **KRAIBURG LEP** in both onshore and offshore sectors.



✓ Advantages

- ✓ High impact damping protects the underlying layer of the laminate structure against impacts, e.g. by water drops or other particles
- ✓ Direct integration through resin infusion during rotor blade manufacture possible (no additional bonding agents required)
- ✓ Retroactive application using a suitable adhesive possible, e.g. when servicing the rotor blades
- ✓ Improved drainage of water drops thanks to low surface tension of the film
- ✓ Excellent UV resistance

About us

Gummiwerk KRAIBURG is one of the leading manufacturers of rubber and silicone compounds in the fields of

- energy supply
- automotive sector
- mechanical engineering
- the printing and paper industry and
- in applications with special requirements

Compounds from Gummiwerk KRAIBURG stand out for their innovative solutions, consistently high quality, performance and reliability

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Founded in Waldkraiburg, Upper Bavaria, Gummiwerk KRAIBURG GmbH & Co. KG. is today a member of the global KRAIBURG group of companies and employs around 400 people.

kraiburg-rubber-compounds.com

PRODUKTTINFORMATION

Technical data		
Features	Standard	Test values
Film thickness (mm)		1.0
Film width (mm)		120.0
Film weight (g/m ²)		990.0
Tensile strength (MPa)	DIN 53504	22.5
Elongation at break (%)	DIN 50504	399.0
Peel adhesion (N/mm)	ISO 813	9.0
Peel adhesion cataplasm test (N/mm)	5 cycles: 12 h @ 70 °C + 12 h @ -25 °C 100 % rel. humidity, ISO 813	8.8
Rain erosion test	ASTM G73, V _{tip} max: 160 m/s rain density: 60 l/h drop size: 2.4 mm	excellent
Splicing: 45° and 90° rain erosion test	ASTM G73, V _{tip} max: 157 m/s rain density: 450 mm/h size of drops: 2–3 mm	excellent
2000h UV exposure	ASTM G154–16 ASTM E13–15e loop	very good
Rain erosion test after 2000h UV-B exposure	ASTM G73, V _{tip} max: 157 m/s Rain density: 450 mm/h size of drops: 2–3 mm	
Fatigue test	Undulation in lead and lag directions cycle: 2x10 ⁶	Adhesion: good Surface: no flaws Bond between film and filler: no formation of flaws

Characteristics

Impact resistance

Films which are available on the market allow the energy of the impacting rain to pass through on to the laminate unimpeded. Extensive tests using X-ray computer tomography show that damage to the fibre composite structure at the point of impact is significantly diminished by using **KRAIBURG LEP**.

Sector and area of use: Onshore and Offshore

KRAIBURG LEP characterized by long-term erosion protection of the blade leading edge of wind turbines. As our material is especially suitable for use in extreme conditions, customers benefit from KRAIBURG LEP in both onshore and offshore sectors

Practical requirement – Partial repair

When developing KRAIBURG LEP, the focus was on practical requirements. Here, the option of partial repairs (splicing) was considered. In this context, a repair point with impact at an angle of 45° and 90° was tested. A ten-hour rain erosion simulation revealed no difference to the undamaged film. This confirms the high durability of **KRAIBURG LEP**.

Reduction of service and repair costs

The service intervals play a crucial role in the life cycle of a wind turbine. A damaged rotor blade surface results in poor performance which in turn results in loss of power output and high repair costs. The use of KRAIBURG LEP helps to reduce service and repair costs.