



Case Study

Corrosion damage on wind turbines? No longer a problem.

New RENOLIT CP corrosion protection film performs outstandingly in long-term test.



The challenge

Wind turbines are exposed to the forces of nature every day and everyone knows that rain, wind and the sun will, sooner or later, cause corrosion on metal surfaces if they are not adequately protected.

The weakest weak points in the steel towers of wind turbines are welded seams and flanges.

Innovative film undergoes field test

In June 2019, the new ISO-certified **RENOLIT CP** corrosion protection film from the renowned film manufacturer **RENOLIT** was applied to a wind turbine near to the German town of Erkelenz. The purpose of this field test was to verify whether the new film offers efficient protection and enables rapid and flexible repairs to onshore wind turbines.

The test was performed in cooperation with **RENOLIT**'s distribution partner, **WP Energy GmbH**, a subsidiary of the **WP Group**. **WP Energy** is a service provider who specializes in inspection, maintenance and repair work for wind turbine manufacturers and operators in the central European region. "The wind turbine in Erkelenz is over ten years old and rust has begun to appear around flanges." says Marek Stawinski, Key Account Manager at **WP Energy**, "This is where we applied **RENOLIT CP**."



Visible signs of corrosion around a flange

The **RENOLIT CP** corrosion protection film offers numerous advantages over paint (coatings) systems: Repair work can be planned more flexibly due to the simpler application process, the short drying time and the fact that the film can be applied in almost all weather

conditions. In addition, the film can be applied with the same thickness throughout and leaves no varnish tears.

RENOLIT CP, certified according to DIN EN ISO 12944-9 CX, provides guaranteed long-term corrosion protection even under extreme conditions. Compared to paint systems, our films are fundamentally more environmentally friendly as they release no solvent vapours which might also be hazardous to health. There is little to none residual waste that must be disposed of as special or even hazardous waste, compared to the situation when working with paint.

What was done?

The flange at the base of the tower was prepared for the application of **RENOLIT CP** corrosion protection film. All existing corrosion and the remaining paint were removed with a rotating wire brush and then intensively cleaned. Finally, a zinc primer was applied. As a comparison: To achieve the same level of corrosion protection offered by **RENOLIT CP** with paint, after the primer has dried, two coating layers of paint plus drying time for each would be necessary.

Finally, the base was applied with a test strip (12m long and 0.19m wide). In addition, as a trial, the tower hatch was also applied with **RENOLIT CP**. This is also an area which is highly prone to corrosion with its edges, 90° angles and seams.

According to Marek Stawinski: "The film was easy and quick to apply to difficult geometries on the hatch. The fast-drying primer and the film as final layer allowed the work to be completed quickly." This reduces repair times and possible turbine downtime, and as a result reduces costs. The durability of the film (10 years) allows maintenance intervals to be extended, and all these factors contribute to reducing overall costs.



Primer applied to both welded seams



20 Months Later – The results

The test result was very satisfactory: At the end of the test phase in February 2021, there is no adhesive peelings or traces of drainage due to chalking in the flange areas or around the hatch. The film provided complete corrosion protection on all treated surfaces.



The film can be used in roll form as shown here or also in the form of patches.



Even after 20 months, the film is still adhering well around the flanges and there is absolutely no adhesive peelings on any of the test areas.



On difficult geometries such as the hatch, **RENOLIT CP** can be applied and fit well. When correctly handled, the surfaces protected by film show absolutely no signs of corrosion during the test.

The colour of **RENOLIT CP** is RAL 7035, “light grey” – the colour in which about 90% of all wind turbines are originally manufactured.



This shows the standard RAL colour “light grey” of the **RENOLIT CP** compared to the faded original paint finish which was originally the same colour.

The result was convincing: The test showed that **RENOLIT CP** is a cost-efficient solution with excellent durability and at the same time, significantly more environmentally friendly compared to conventional paint coatings. The film can be used in the form of rolls or patches. Its adhesion is optimal on vertical surfaces (+/- 10°), and, as the test proved, on challenging geometries as well.

Facts and figures at a glance:

Age of the wind turbine:	> 10 years
Wind turbine type:	NM 1000/60
Product used:	RENOLIT CP Corrosion Protection Film for wind turbines
Certification:	ISO 12944-9 CX
Durability:	10 years
Colour:	RAL 7035, “Light grey”
Size of the test strip:	12m x 0.19m
Applied since:	June 2019