



## Netherlands Power Grid

Protecting foundation bolts on electricity pylon  
Case Study

**OXIFREE**<sup>®</sup>  
METAL PROTECTION

## Corrosion Protection of Foundation Bolts on Electricity Pylons



Location	Bleiswijk, The Netherlands
Local Environment	Outdoors
Date	April 2017
Condition	Dry
Total Coatings	52
Substrate Type	Foundation Bolts
Duration	1 Day

### Summary

Oxifree TM198 was used to protect 52 foundation bolts on an electricity pylon in Bleiswijk, The Netherlands for Tennet. These bolts are subject to a varied weather environment where corrosion is a common problem causing maintenance and functionality issues.

### Introduction

Tennet are a leading European electricity transmission system operator with activities in the Netherlands & Germany. They ensure a reliable and uninterrupted supply of electricity to over 40 million people. There are currently 3,200 monopiles throughout the Netherlands with plans to construct more.

### Objective

Oxifree were invited to carry out a trial coating of Oxifree TM198 on 52 bolts which currently suffer from corrosion due to the exposed location.

Oxifree TM198 was selected as the solution as it required no surface preparation and was quick to apply providing immediate protection.

### Process

Any loose rust was removed with a wire brush and in preparation, and to speed up the application process and minimise material use, a selection of moulds were placed in position over the Nut/Bolt structures.

Before



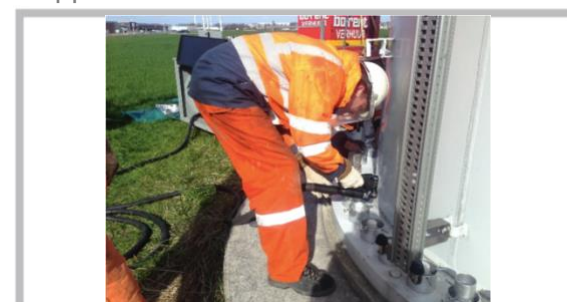
Before



Installation of moulds



Application



# Case Study



## Solution

The moulds were filled with TM198 using a Polymelt 50 applicator machine. The mould design can be further improved to minimise material usage and speed up the application process.

With the current moulds the application time for all 52 nuts/bolts was approx. 2 hours, so with more efficient designs we estimate that up to 6 monopiles can be protected in a 12 hour day. (Weather-dependant).

TM198 starts working immediately and does not require equipment to be shutdown.

*Complete*



*Complete*



*Complete*



## Conclusion

Traditional solutions of blasting/painting for bolts is expensive and ineffective – the paint locks the nut to the bolts and eventually corrosion sets in further leading to the complex maintenance issues.

Oxifree TM198 is the only viable cost-effective solution, no blasting is necessary and humidity/temperature is not an issue during the application process.

Oxifree TM198 is re-usable during the application process, so there is minimal waste.

Oxifree TM198 has been tested in harsh environments and has proved to protect assets from corrosion.

Oxifree TM198 can be easily removed with a knife for maintenance or inspection purposes.

# Case Study



## Further Inspection

To review the protection TM198 was providing, 2 assessments were carried out at 6 and 22 months post application. The material was simply cut away with a knife and the material peeled off.

*Removal after 6 months*



## Assessment – 6 months

Oxifree TM198 removed from 1 bolt 6 months after application shows the bolts are still in good condition with no evidence of corrosion present.

*Bolts 22 months after application*

## Assessment – 22 months

You can see how the coating on the bolts have collected dust and debris having been exposed in this varied environment. In an unprotected situation this would have caused extensive corrosion, but this is not the case in the protected bolts.



Oxifree TM198 was removed from 1 bolt 22 months after application to show the bolt was still in great condition and free of corrosion – ready for any maintenance that should be required.

*Removal after 22 months*

These exposed bolts were simply encapsulated once again in TM198 and will continue to be protected for many years to come. The trial was a success.

