

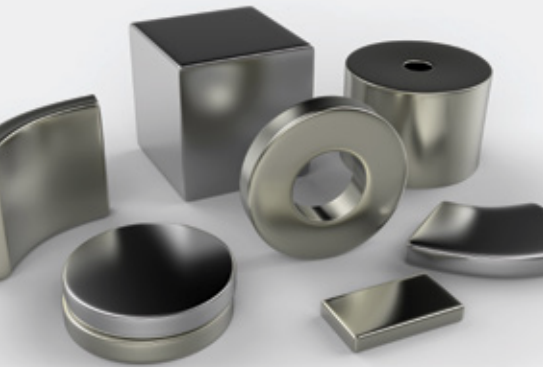
# New Anti-Corrosion Coating for Rare Earth Magnets

[www.emcoatingsuk.co.uk](http://www.emcoatingsuk.co.uk)

## COMPANY PROFILE

At the forefront of the latest designs, materials and technologies, E/M Coating Services pride themselves on offering high quality coating applications and processes to improve performance and extend the life of critical components and fabrications of all shapes and sizes for a wide range of industrial sectors. With specialised facilities we are able to design and manufacture bespoke coating systems and have in-house NACE Level 3 trained Inspectors.

Quality is at the heart of our business and we operate under the highest quality control procedures including AS9100 Rev C, NADCAP, ISO9001/9008 and NACE.



E/M Coating Services are a business unit of Surface Technologies, a Division of Curtiss-Wright, who are global specialists in surface treatments to improve the life and performance of critical components and preventing premature failures through their network of over 75 facilities worldwide. [www.cwst.co.uk](http://www.cwst.co.uk)

Neodymium Iron Boron magnets are utilised in a wide number of industries, including the highly demanding wind turbine industry.

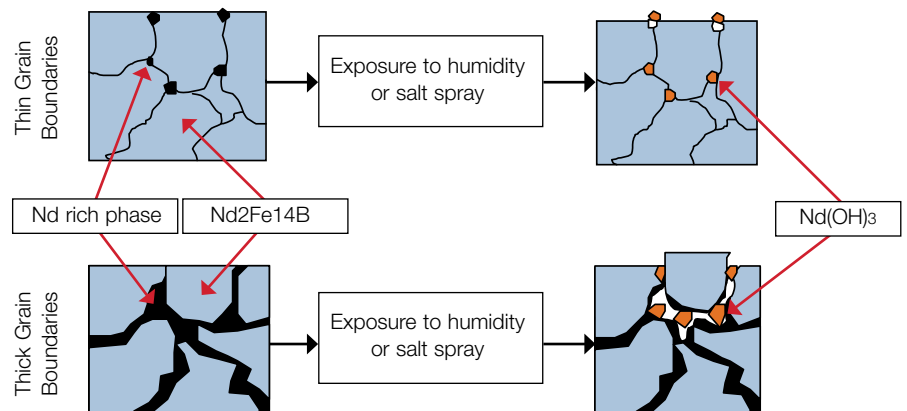
A multitude of these magnets are bonded together to increase the overall level of magnetism. This process leads to two potential issues: Firstly, any adhesive or coating between the magnets acts as an air gap and thus reduces the level of magnetism and secondly NdFeB magnets corrode extremely aggressively. This corrosion issue is exacerbated by the environmental conditions that the wind turbines face.

The corrosion mechanism for NdFeB magnets is detailed in Figure 1. This shows that when exposed to water or humid conditions, the Neodymium rich layers at the grain boundaries react to form Neodymium Hydroxide. The effect of this conversion from Nd to  $\text{Nd}(\text{OH})_3$ , is a large volume increase along the grain boundaries, leading to cracking and degradation of magnet properties.

Curtiss-Wright Surface Technologies (CWST) has been working on a solution to these issues. This involved developing a high grade anti-corrosion coating with minimal coat thickness (effective air gap). The current market leader for corrosion protection is CWST's own Everlube® 6155 providing 500 hours protection in the ASTM B117 salt spray test.

After extensive studies and trials, CWST is pleased to announce they have successfully developed a coating system which will provide 1,000 hours salt spray resistance for NdFeB magnets at a coating thickness of just 25µm. This NEW coating system – **Everlube® 1155** is environmentally friendly, easy to apply and a cost effective solution to this critical problem. **Please call on +44 (0)1386 421444 for further details.**

Figure 1: Shows the corrosion mechanism for NdFeB rare earth magnets.



## E/M Coating Services

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## Why should you choose Curtiss-Wright Surface Technologies (CWST) to deliver your surface treatments:

A worldwide supported network service of over 75 facilities, including on site field crews

## We offer a diverse range of quality surface treatments including:

- Controlled shot peening
- Shot peen forming
- Laser peening
- Engineered coatings
- C.A.S.E.™ super finishing
- Surface texturing
- Material testing
- Repair and overhaul

Proud history of experience and innovation dating back to the Wright Brothers and Glen Curtiss who formed the Curtiss-Wright Corporation in 1929

As a single source for all your surface treatments we can improve your turnaround times and save you money

Customer's trust us to improve the performance, strength and life of their components, including the repair and overhaul of worn components

Long experience in protecting components from fatigue, corrosion, wear, galling, fretting and environmental attack in key industries

We maintain all appropriate customer and industry quality approvals including ISO 9001, NADCAP, AS9100 and ISO 13485

Tailoring our services to meet your needs



The Dublin Spire – a stunning example of our surface texturing technique showing the versatility of controlled shot peening

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