

The magic of zinc in corrosion control

By [Simon Norton](#)

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Zinc is truly a magic metal that few people and few engineers appreciate for its multitude of applications and versatility. For us in the corrosion world, where we seek to extend the life of atmospherically-exposed steel, zinc is best-known in terms of corrosion control.



Yet how many architects, designers and consulting engineers truly realise the magic that zinc quietly performs all around us, protecting railways, bridges, concrete, power pylons and mining structures from catastrophic failure due to corrosion? Zinc is an abundant and essential element, non-toxic and safe in use.

Zinc is used extensively to coat steel to prevent corrosion. Zinc oxide is a unique and very useful material in modern civilisation. It is widely used in the manufacture of paints, rubber products, cosmetics, pharmaceuticals, floor coverings, plastics, printing inks, soap, storage batteries, textiles, electrical equipment and other products. Zinc sulphide is used in making luminous dials, X-ray and television screens and fluorescent lights.



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Zinc has an extraordinary capacity to protect uncoated steel structures against premature corrosion. If zinc is alloyed with aluminium to form Zinalume, and this is coated onto thin steel sheet (continuous galvanising) and receives a resilient organic coating, then that becomes long-lasting as roof sheeting or cladding for buildings.

Hot dip galvanising

Where zinc really comes into its own is in hot dip galvanising of steel items, wire, poles, steel structures and reinforcing steel for concrete systems. Once the hot dip galvanised item is exposed to the atmosphere and a corrosive environment, then the zinc that is metallurgically bonded to the steel starts to perform its magic.



Hot dip galvanising of steel takes place in a galvanising kettle. Once the steel is removed from the molten zinc in the kettle, it is ready either to be painted with an organic coating system to give even more corrosion protection to the steel, or it can be left unpainted and used as is and exposed to the atmosphere.

When the steel is immersed in the molten zinc in the kettle and removed for cooling, the result is a metallurgically magic system that protects the underlying steel, although in fact with time the zinc is being sacrificed to protect the steel. So, when you are next out and about, take time to see if you can spot a galvanised steel structure. You will be amazed at the prevalence of galvanised steel!

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