

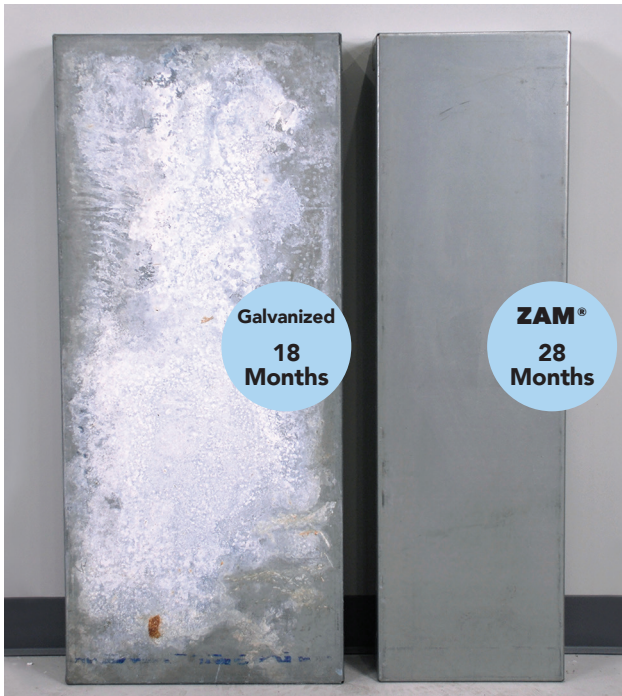


ZAM®

Corrosion Resistant Steel Wall Pools

by Cardinal

What is ZAM® ?



Galvanized steel compared to ZAM® steel exposed to normal weather conditions

The Next Evolution in Non-Corrosive Coatings

Cardinal Systems Inc. is proud to offer the next step in the evolution of non-corrosive coatings - ZAM®. "ZAM® is a highly corrosion resistance hot dip coated steel sheet that has a coating layer of zinc, 6% aluminum, and 3% magnesium. Due to the effects of magnesium and aluminum, ZAM® has excellent corrosion resistance, scratch resistance as well as formability.

Cardinal uses ZAM® 115 which is the most effective coating in the pool industry. More reasons to use ZAM® are:

- Offers superior protection against corrosion on Salt Generator Pools, up to 5x more effective than standard galvanization.
- If you service an area with a high water table or acidic ground conditions, ZAM® offers you increased protection.
- Coating flows over sheered edges for superior protection.
- Sheet steel can be bent without the coating cracking on the edges.
- Cardinal ZAM® coated steel is covered by a lifetime , 1 time transferable warranty.

Corrosion Resistance

Superior corrosion resistance of ZAM®

Superior corrosion resistance on cut edge

Appearances of cut edge sections after salt spray test (Thickness 0.126", coating weight 0.40/0.40 oz/ft² , no chem treat)

ZAM® produced to ASTM A1046 specifications

Time	100h	1,000h	5,000h
ZAM®			
55% Al-Zn alloy coated steel			
Zn-5% Al alloy coated steel			
Galvanized steel			

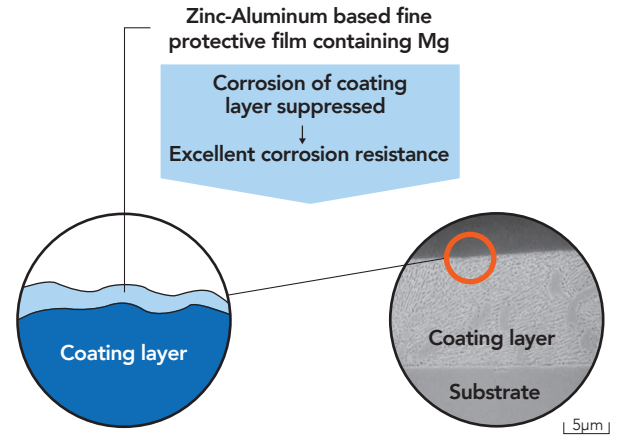
Corrosion resistance mechanism of ZAM[®]

Mechanism of corrosion resistance on flat section

Al and Mg in the coating layer of ZAM[®] combine to form a fine, tightly adhered zinc-based protective film on its coating surface as time passes. This protective film suppresses corrosion of the ZAM[®] coating.

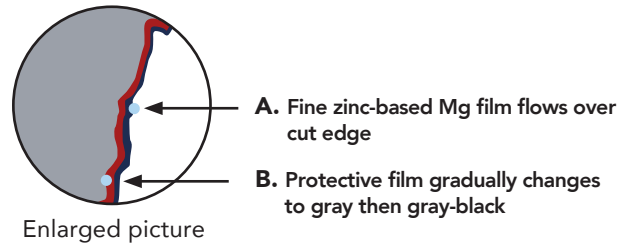
- Galvanized coating layer also forms a protective film on the surface. This protective film, however, is not as fine as in ZAM[®], and less adhesive.

In contrast, the protective film formed on the coating surface of ZAM[®] is excellent in both fineness and adhesion, and consequently it inhibits permeation of corrosion factors, preserving high corrosion resistance over a long period.

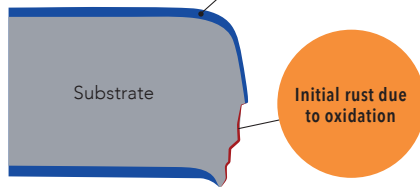


Mechanism of corrosion resistance on cut edge

Excellent corrosion resistance is achieved on cut edge parts by covering the ends with a zinc-based protective film that contains Al and Mg leaching from the coating layer.

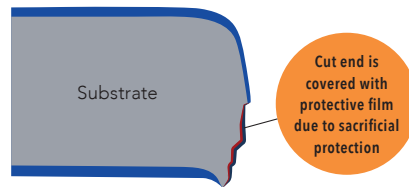


Initial exposure period
(up to several weeks)



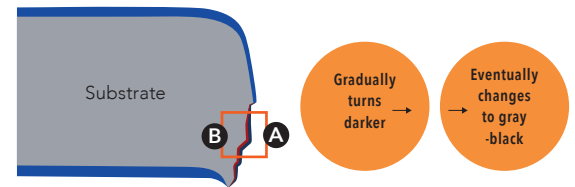
The exposed cut edge of substrate is oxidized due to rain, condensation, etc.

Intermediate exposure period
(several weeks to several years)



The fine zinc-based protective film containing Mg covers the cut edge with leaching of Zn, Al, and Mg from the coating layer.

Long exposure period



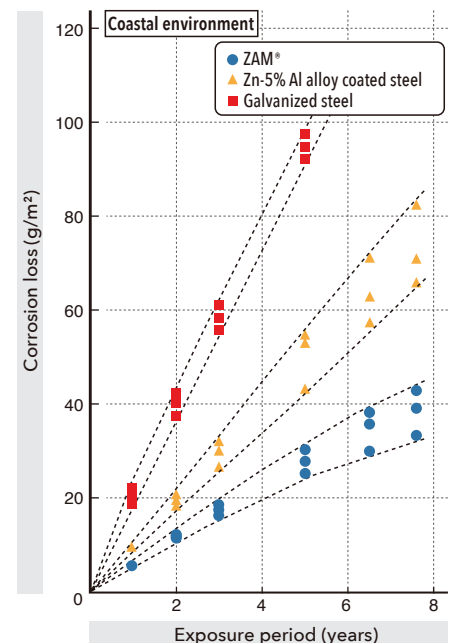
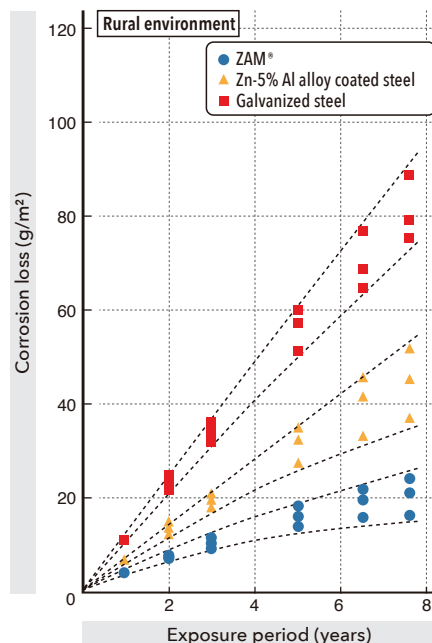
Outdoor exposure test results

Corrosion loss of coating layers after outdoor exposure test

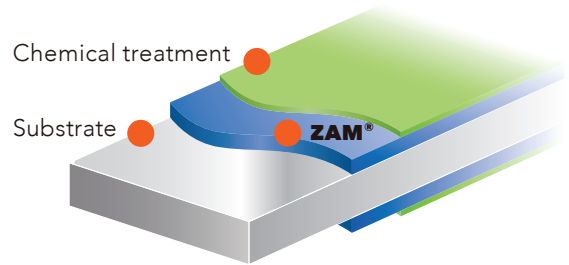
ZAM[®] shows approximately four times higher corrosion resistance than hot-dip zinc-coated (according to the results of 8 years of exposure test)

Outdoor Exposure Test Site

	Exposure site
Rural environment	Kyiryu-City, Gunma
Coastal environment	Nakagusukuson, Okinawa (approx. 30m from the seashore)



- Long product life
- Light coating weight yet high corrosion resistance
- LCC (Life Cycle Cost) Reduced repair cost
- Reduction in both coating and transportation costs
- Substitute for post hot-dip galvanizing
- Eco-friendliness through process saving



Q. Why is ZAM® environmentally friendly?

A. ZAM®'s superior corrosion resistance will allow customers to significantly reduce coating thickness which benefits the environment. Specifically, reducing coating thickness effectively decreases the amount of minerals mined from the earth, reduces harmful runoff dispersed into the soil and reduces coating residue at steel recycling plants.

Q. Why is ZAM®'s corrosion resistance superior to other coated products?

A. ZAM®'s unique chemical composition of Zn, Al and Mg combines to form a very tight and hard coating layer. This unique coating develops thin film byproducts that are remarkably corrosion resistant—even over cut edges.

Q. How does the ZAM® coating layer migrate over cut edges?

A. When the ZAM® coating layer corrodes in the rain, Zn and Mg flow over the cut edge. These elements form a fine zinc-based protective film.

Corrosion mechanism of ZAM®

