

# ZAM<sup>®</sup>

**Corrosion Protection of the 21<sup>st</sup> Century**

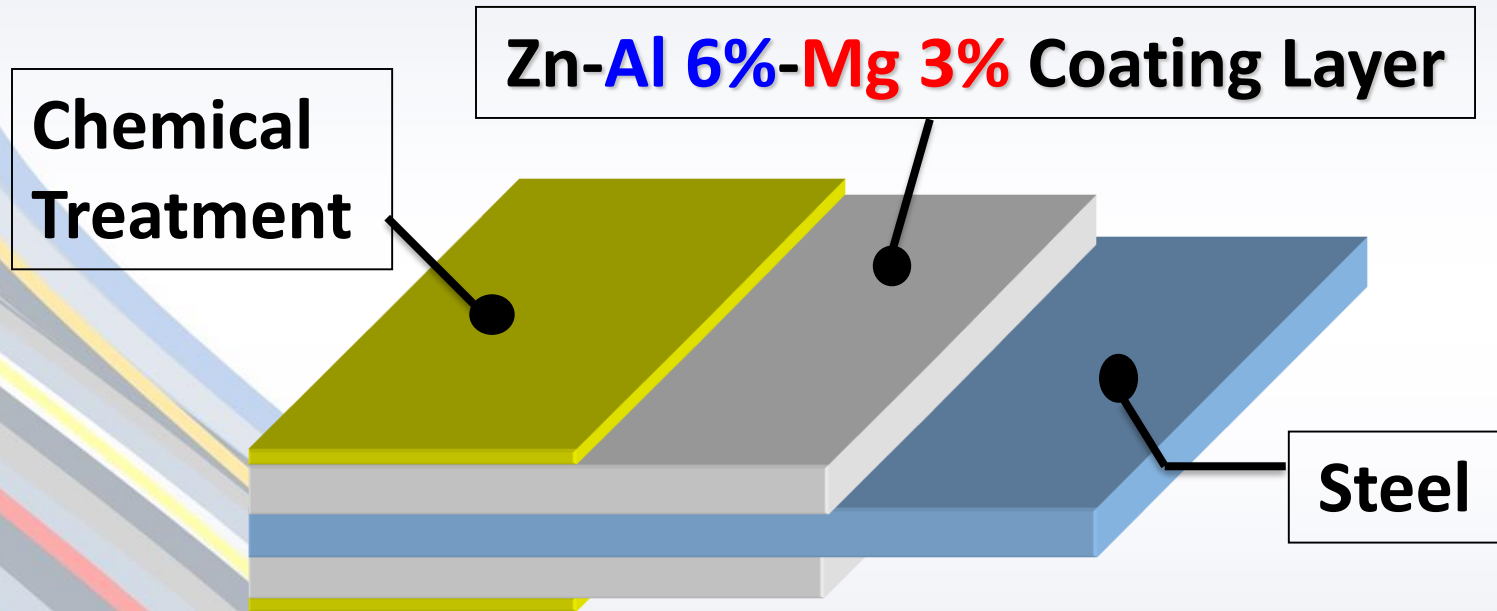


\* **“ZAM” is a registered trademark of NIPPON STEEL CORPORATION in Japan (Reg. No. 4637134), the United States (Reg. No. 3254099) and other countries and regions.**

**“ZAM” is the brand name of high corrosion resistance hot-dip coated steel sheets developed by NIPPON STEEL CORPORATION**

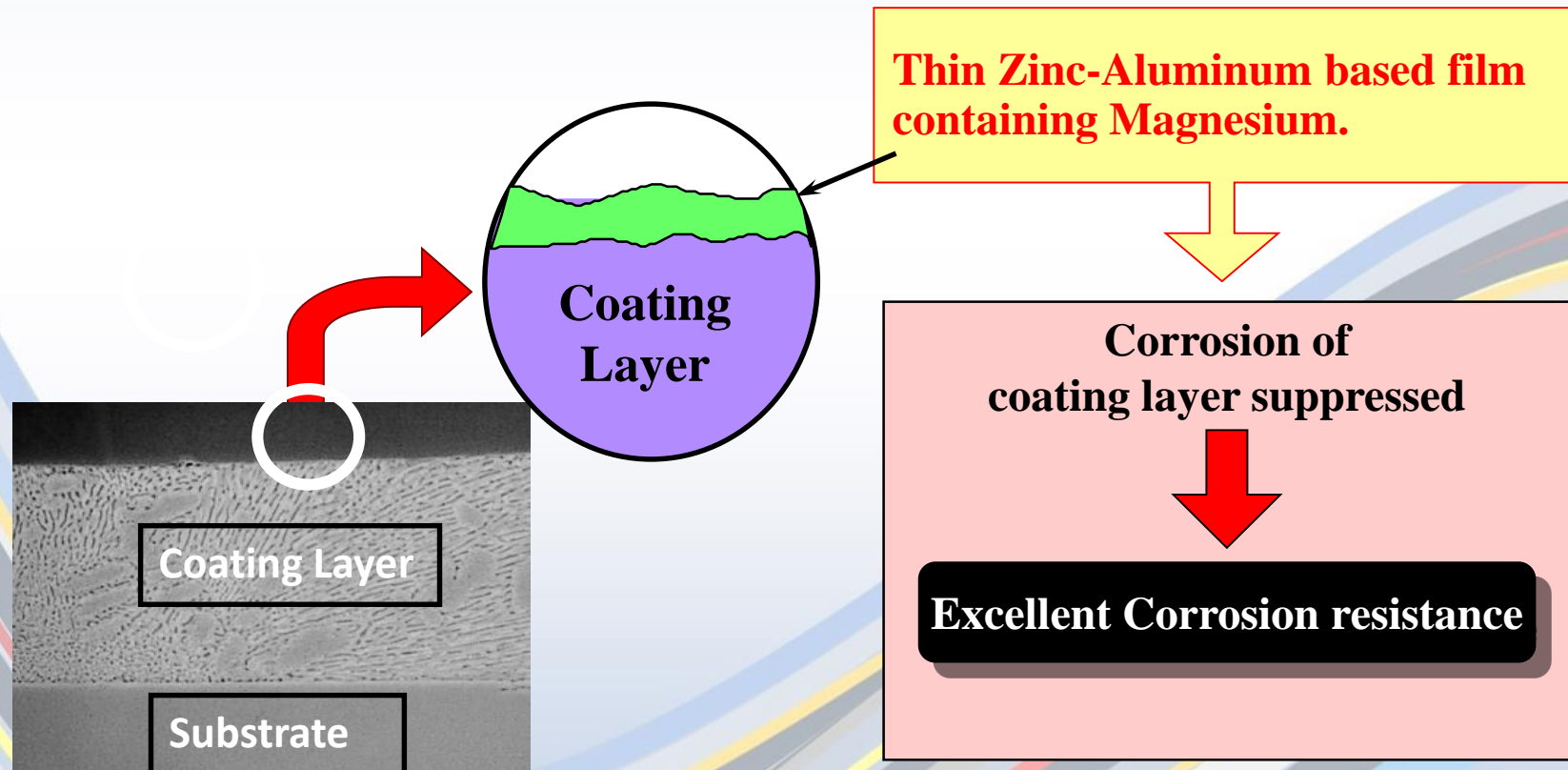
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# Highly Corrosion Resistant Coated Steel

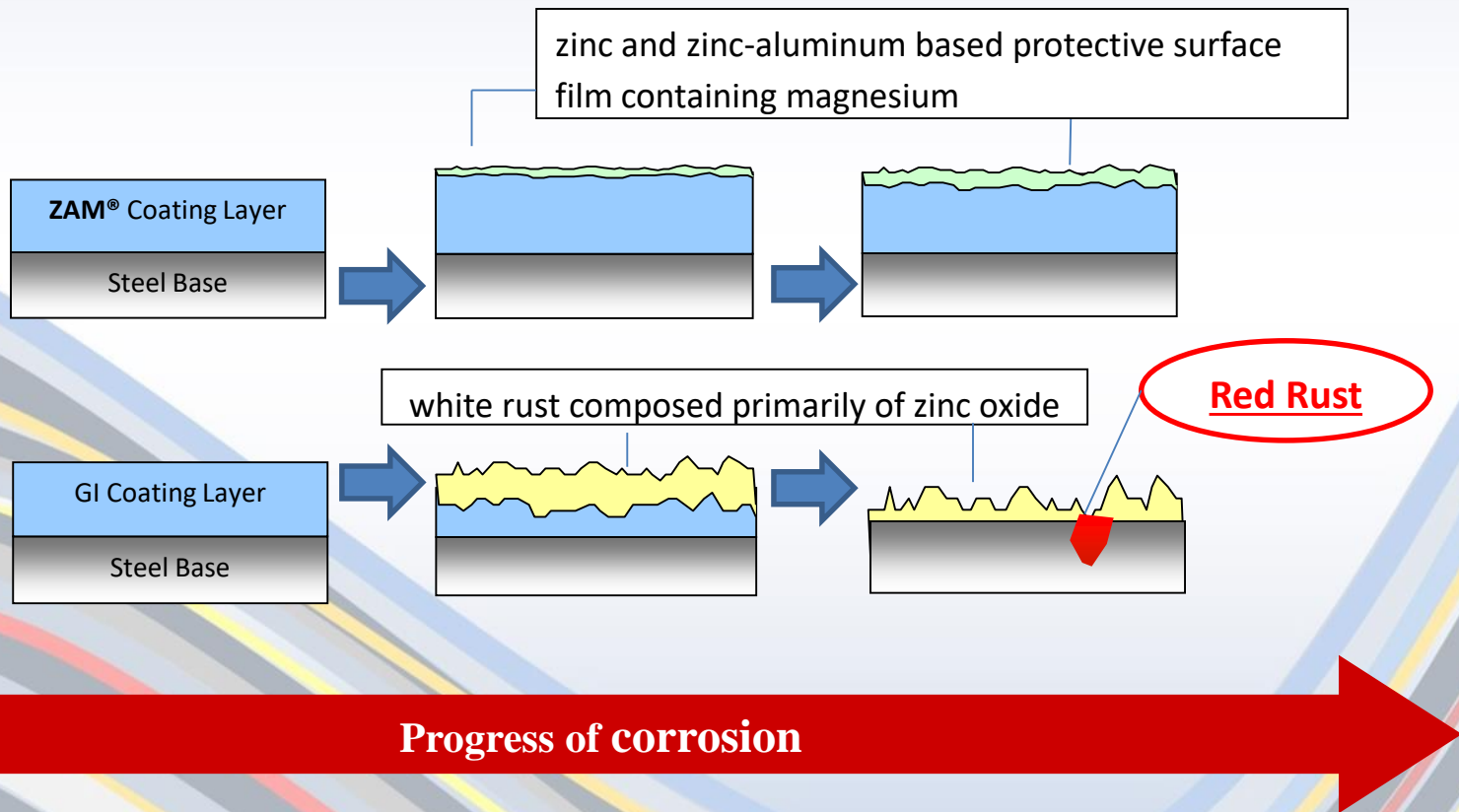


# Corrosion Mechanism Of ZAM<sup>®</sup>

- Mg & Al form a fine, tight protective film


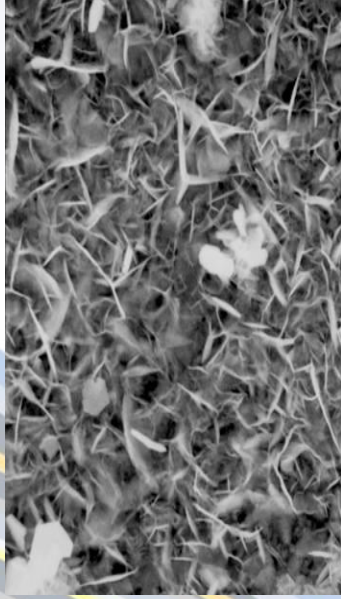
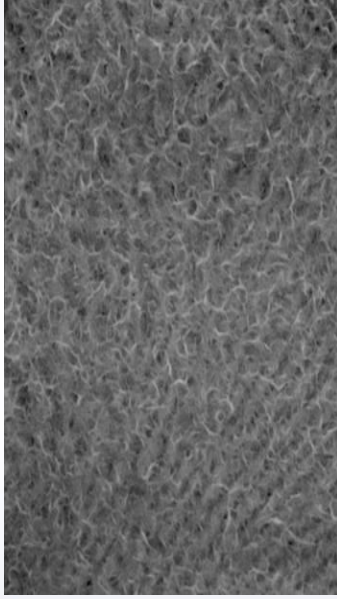
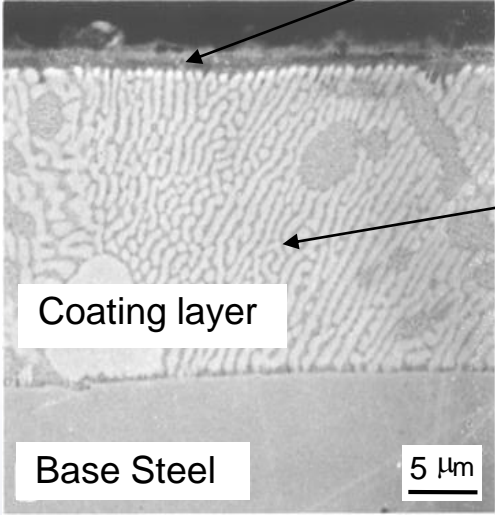


# Corrosion Resistance of ZAM<sup>®</sup>





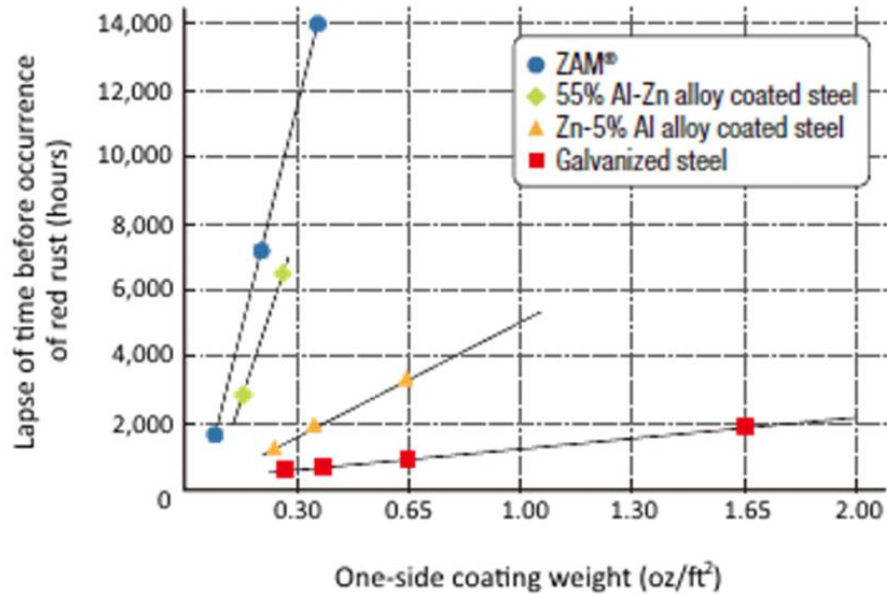
# ZAM<sup>®</sup> fine dense corrosion products





| GI (Zn)   | Galvan (Zn-5%Al)   | ZAM <sup>®</sup> (Zn-6%Al-3%Mg)   |  |
|---|--|---|--|
|  |  |  |  |
| Porous & coarse   | Porous   | Fine & compact corrosion products   |  |

Appearance of corrosion products after 4hrs salt spray test (Coating mass : 0.30 oz/ft<sup>2</sup>)

# ZAM<sup>®</sup> Corrosion on Flat Side

Red rust occurrence after salt spray test (untreated)



| ZAM <sup>®</sup>   | Galvanized   | Zn-5%Al   | 55%Al-Zn   |
|--|--|---|--|
|  |  |  |  |

\*2,500 Hours of Salt Spray (Coating Weight: .30 oz/ft<sup>2</sup> on one side)

# Corrosion Mechanism on Cut Edge

ZAM<sup>®</sup> coating layer

Substrate

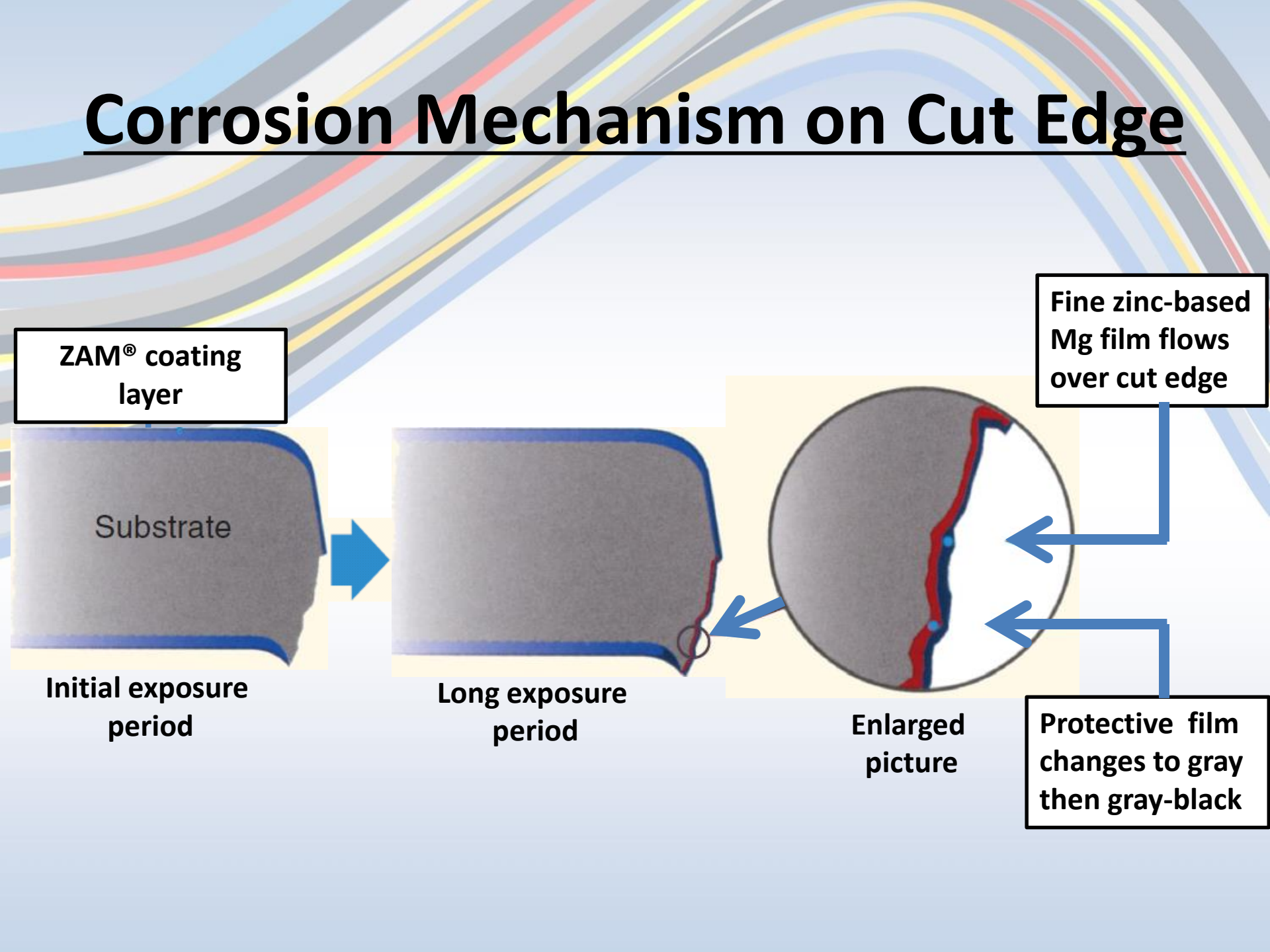
Initial exposure period

Long exposure period

Enlarged picture




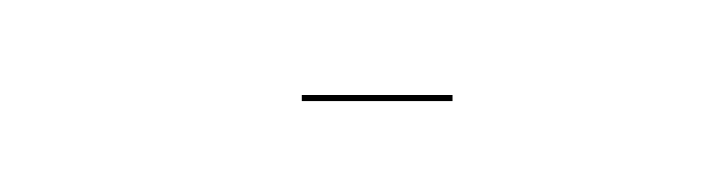



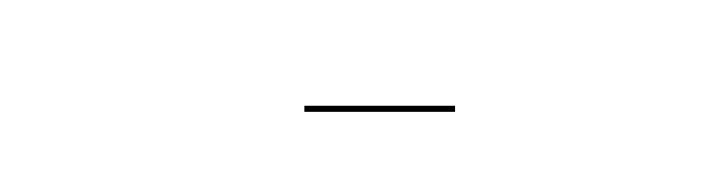
Fine zinc-based Mg film flows over cut edge

Protective film changes to gray then gray-black





# ZAM<sup>®</sup> Cut Edge Corrosion Resistance

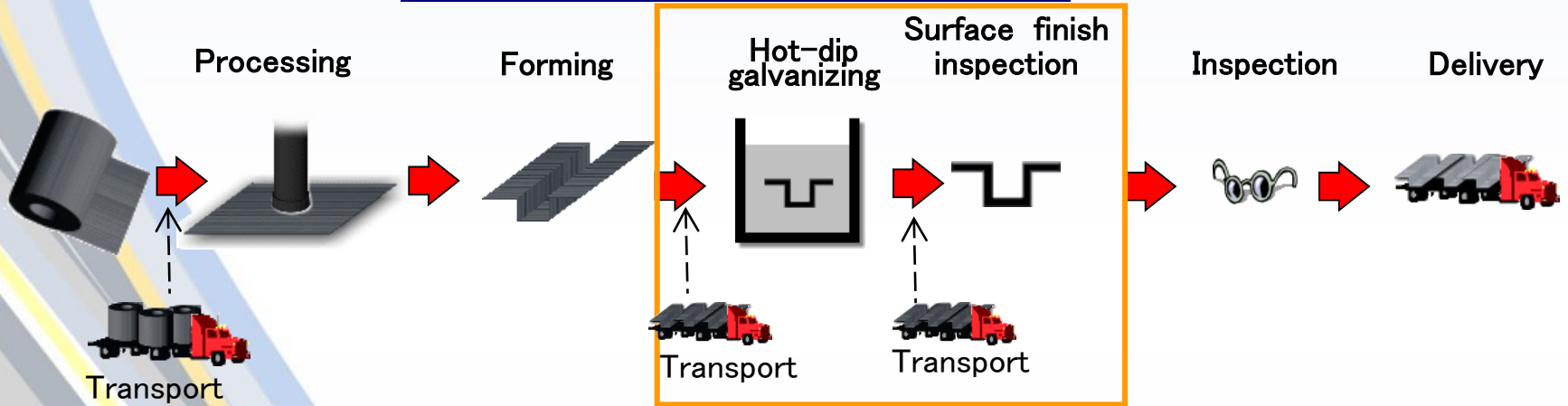
|                  | 1000h  | 4000h   |
|------------------|--|---|
| ZAM <sup>®</sup> |    |    |
| GI               |    |    |
| Zn-5%Al          |   |   |
| 55%Al-Zn         |  |  |

\*Appearance of cut edge after salt spray test (Gauge: 0.091"; Coating .30 oz/ft<sup>2</sup> on one side)

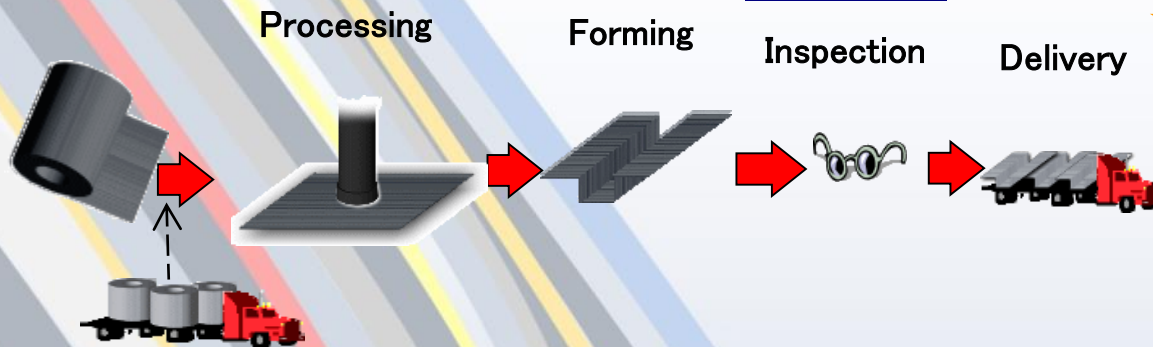


# ZAM<sup>®</sup> Replaces Post Hot Dip GI

## Post hot-dip galvanized products



**ZAM<sup>®</sup>**



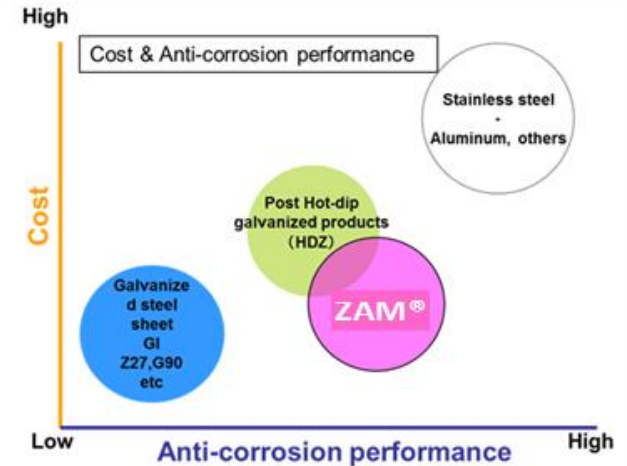
**ZAM<sup>®</sup> Eliminates  
Process  
=  
Cost Reduction**

# ZAM<sup>®</sup> Best Applications & Target Markets

## *Best Applications:*

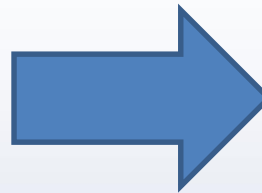
- Heavy GI coating → ZAM<sup>®</sup>
- Post dipped GI → ZAM<sup>®</sup>
- Heavy gauge GL → ZAM<sup>®</sup>
- Stainless steel → ZAM<sup>®</sup>
- Environmental → ZAM<sup>®</sup>

Positioning of ZAM<sup>®</sup>: Cost vs Anti-corrosion performance



Targets

- Agriculture Related
- Animal confinement
- Swimming Pool Walls
- Solar Racking (UL2703)
- Architectural Panels
- Highway Construction
- Fence / Railing
- Automotive



## Nippon Steel Examples:

- Construction framing
- Green house tubing
- Solar racking
- Automotive parts/covers
- Electrical panel/cabinet
- A/C panels / base tray
- Agriculture building

# Benefits of ZAM<sup>®</sup>

- **Longer life than other coatings**
- **Cut edge rust protection**
- **Thinner coating yet more protection**
- **Excellent in severe environments**
- **Eliminates need for post dip galvanizing**
- **Superior formability – harder coating**
- **Cost savings through less maintenance**
- **Bridge between stainless and heavy galvanized**