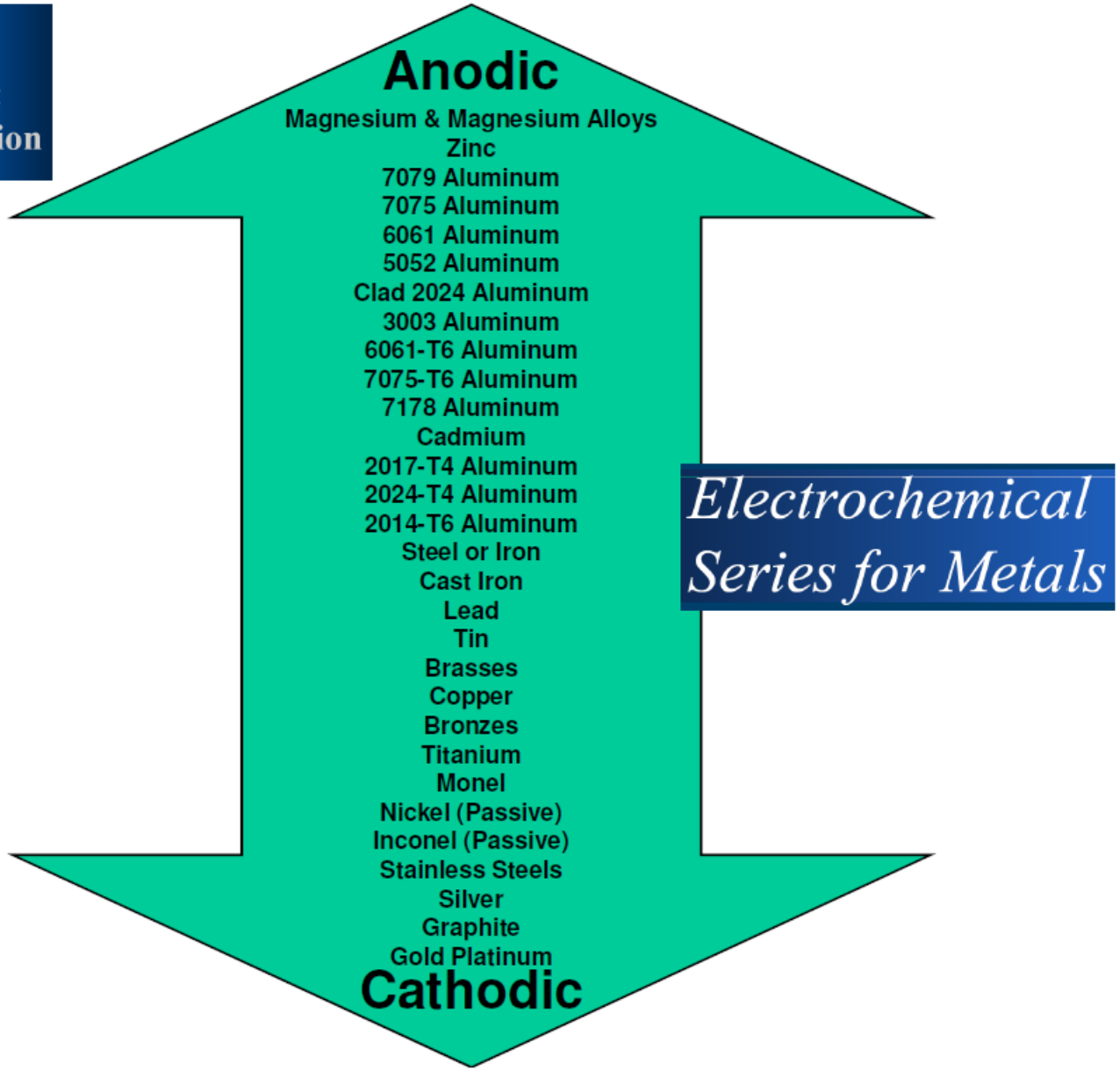
Thixomolding – Galvanic Corrosion Protection

PARKWAY

Priority #1

Protection against galvanic corrosion



PARKWAY

The Galvanic Circuit

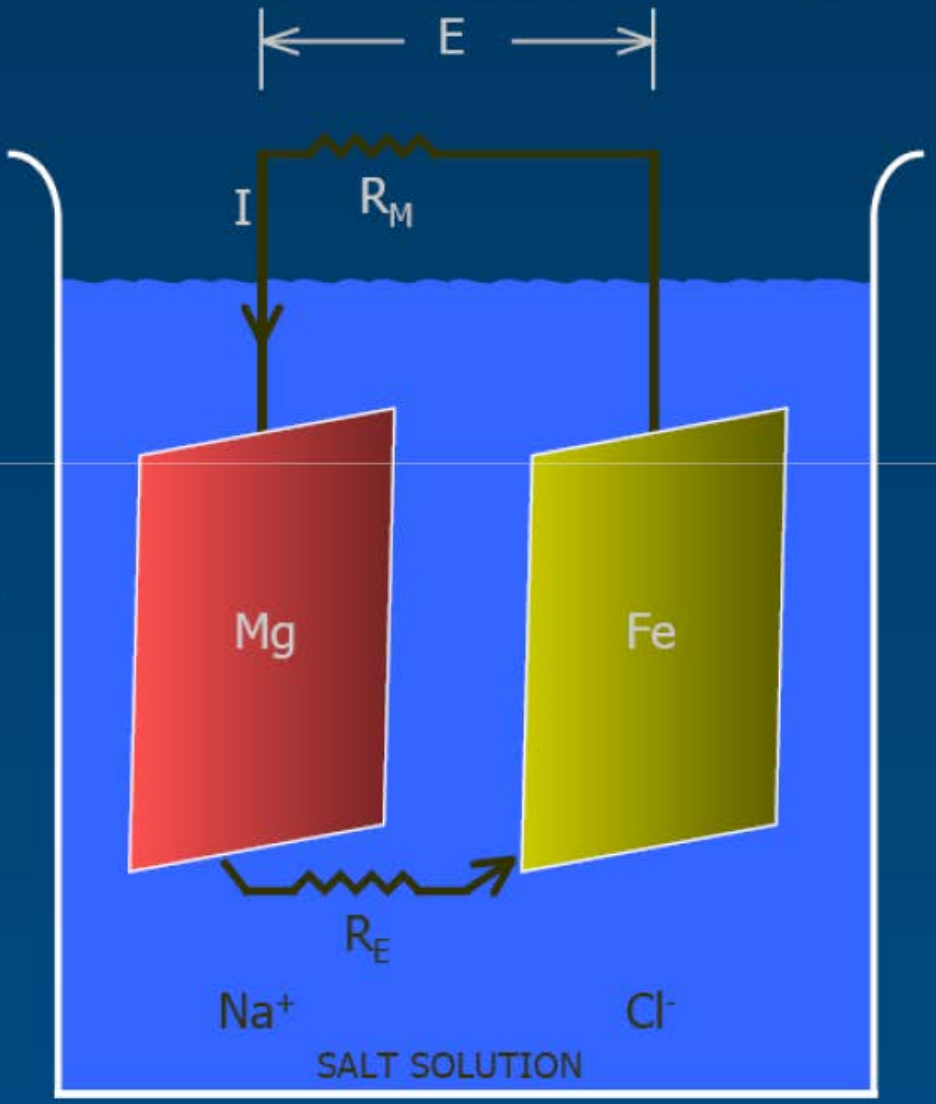
$$I = \frac{E}{R_E + R_M}$$ where

I = galvanic current

E = effective (polarized) difference between the magnesium and the dissimilar metal

R_E = resistance of the electrolytic part of the circuit

R_M = resistance of the metallic part of the circuit



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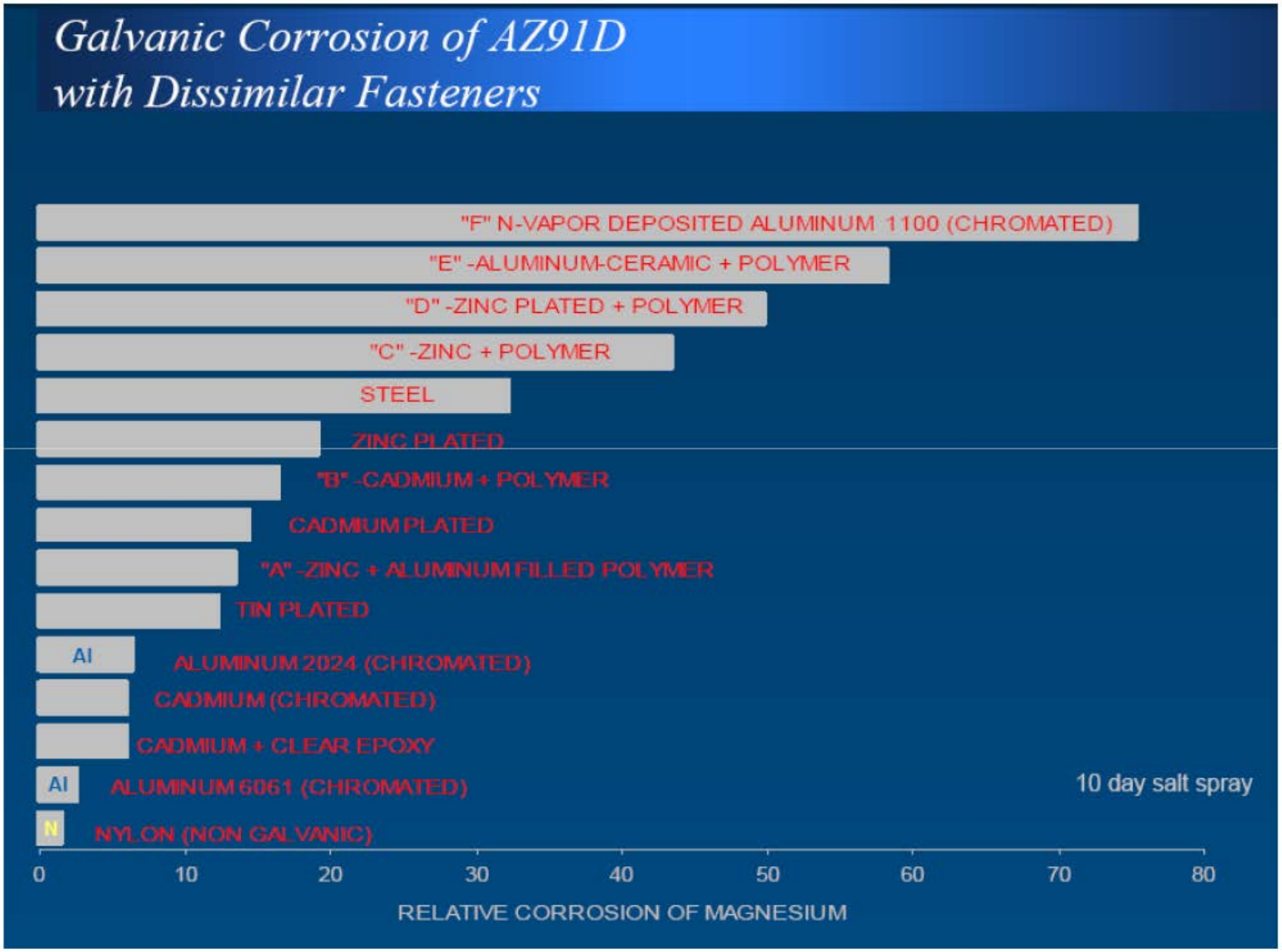
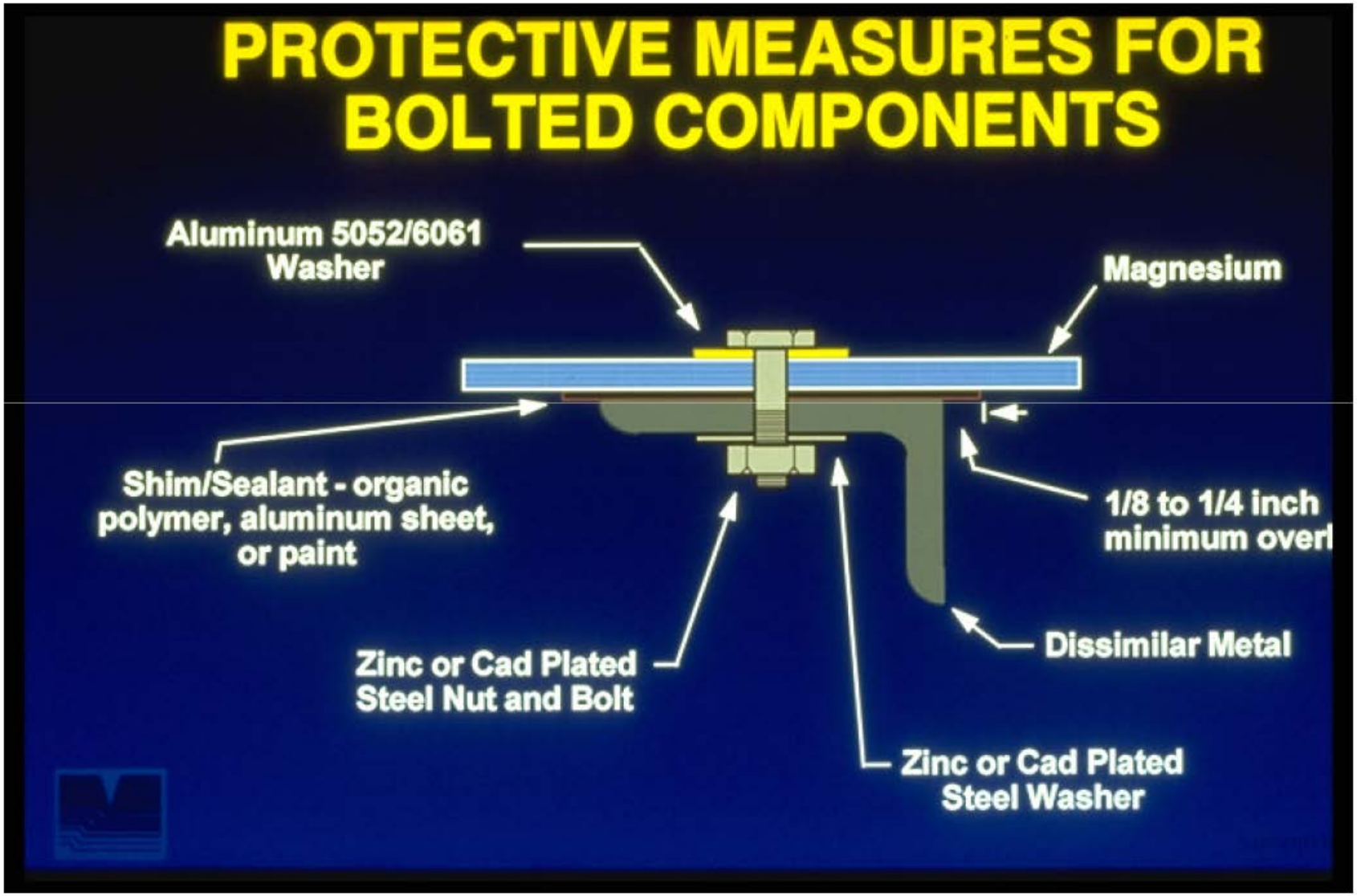



PROTECTIVE MEASURES FOR BOLTED COMPONENTS
Aluminum 5052/6061 Washer
Magnesium
Shim/Sealant - organic polymer, aluminum sheet, or paint
1/8 to 1/4 inch minimum overl
Dissimilar Metal
Zinc or Cad Plated Steel Nut and Bolt
Zinc or Cad Plated Steel Washer

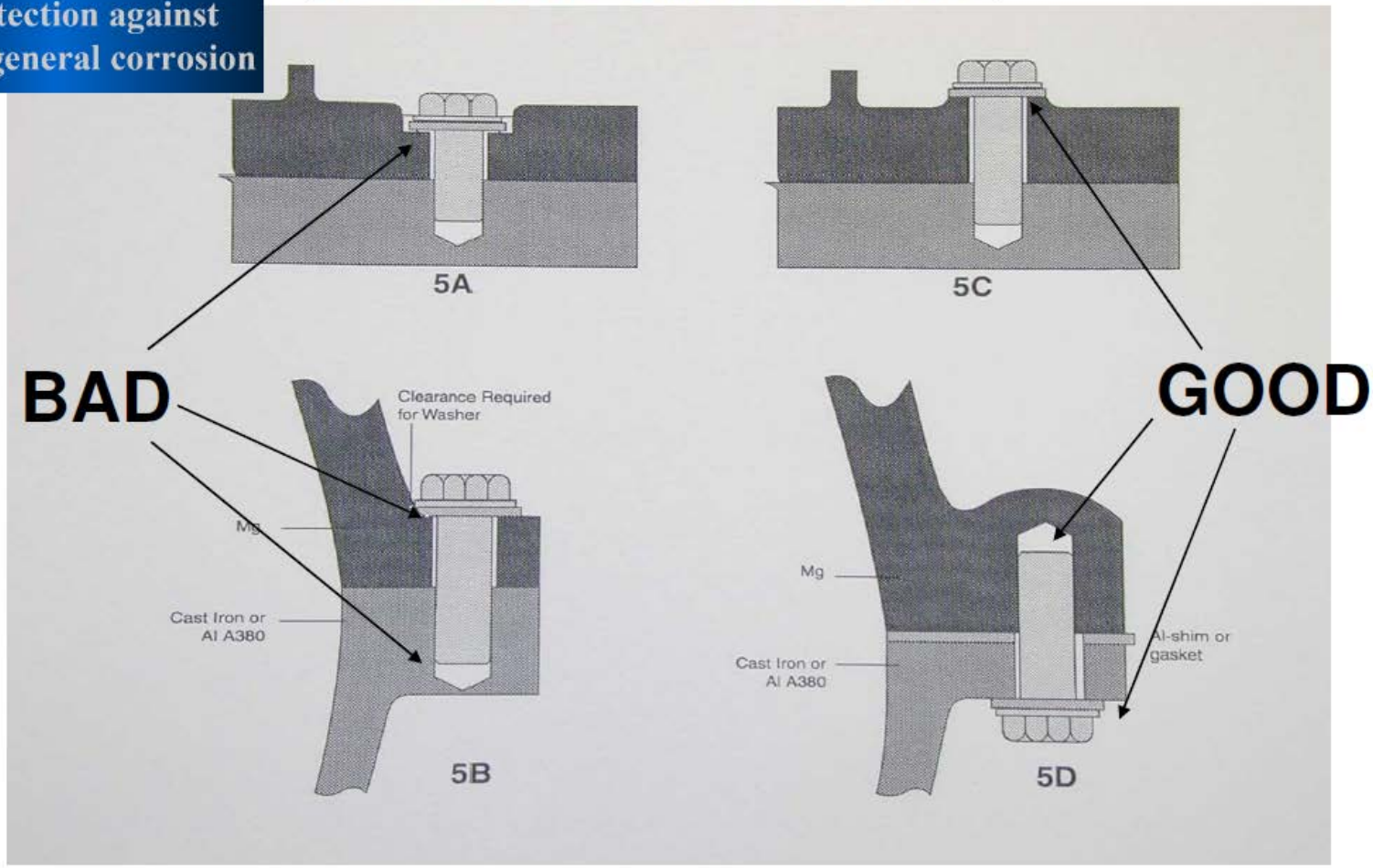

Fastener Choices
plastic coating
Cd plate + Cr
Xylan coating
sealed ceramic coating

PARKWAY

Priority #2

Protection against general corrosion

GOOD AND BAD DESIGNS

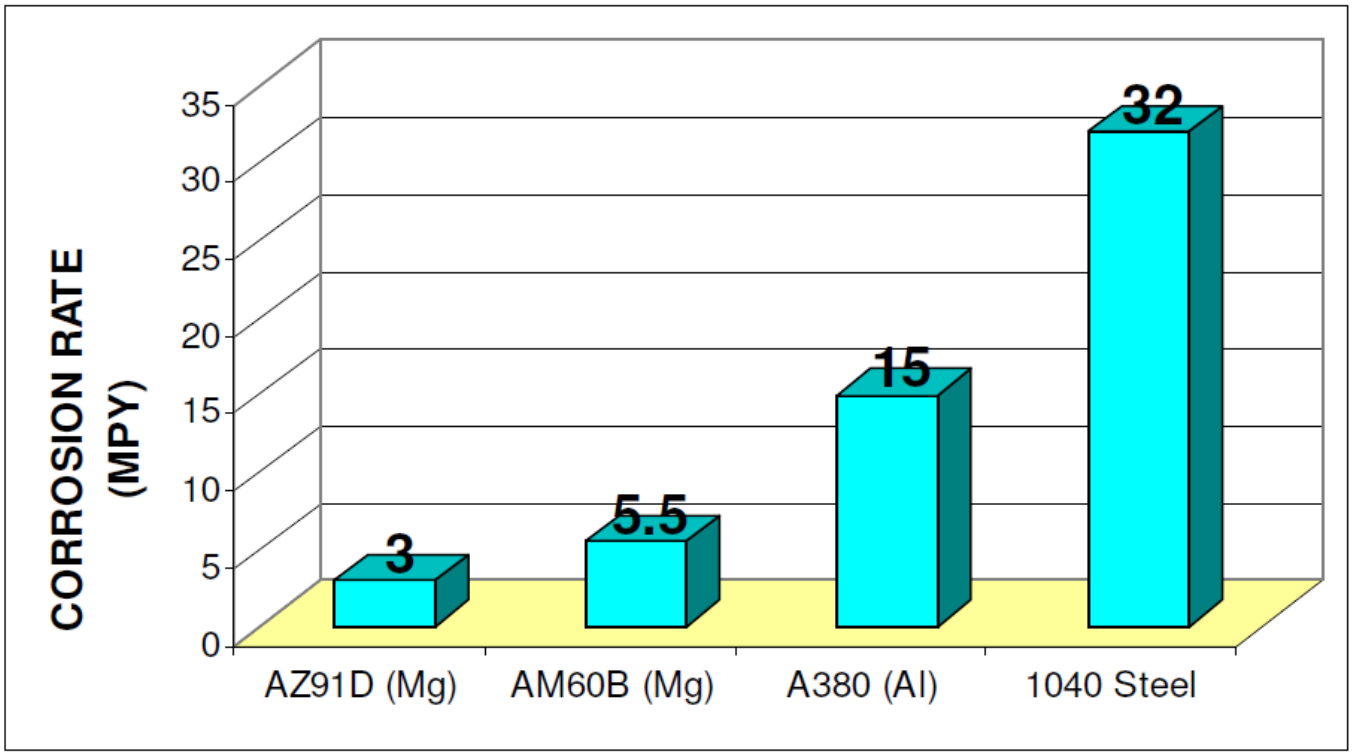


ELIMINATE ELECTROLYTE OR DIRECT CONTACT

PARKWAY

SALT SPRAY CORROSION

* 10-DAY ASTM B-117 (Salt Fog) Test



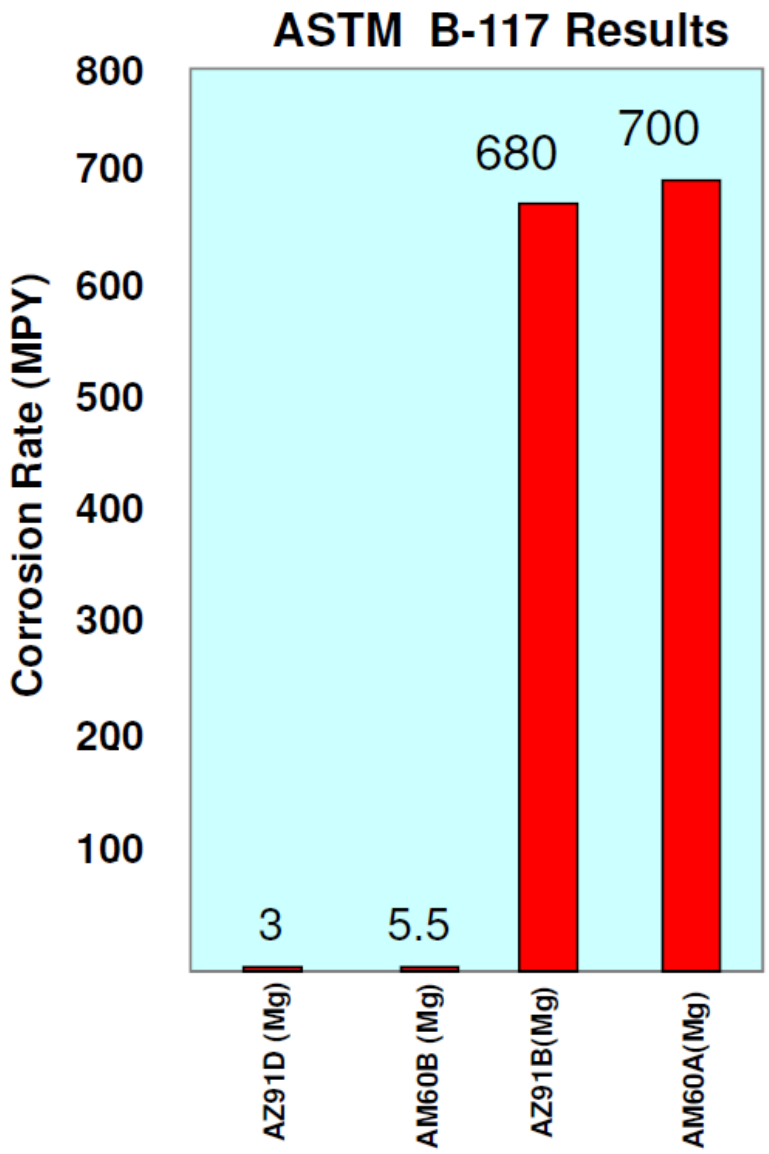
Mg TXM Salt Spray Corrosion performance excellent

- *AZ91D : 3-4 Mils Per Year(MPY) lost in ASTM B-117 Test Panels*
- *4 - 5 X better than Cast Aluminum Alloys*
- *8-10 X better than Steels*

SALT SPRAY TEST PANELS

Thixomolding – Corrosion Protection

PARKWAY



HIGH PURITY ALLOY BENEFIT

- *Corrosion "issues" of 1960's vintage alloys no longer dominant to designs*
- *High Purity Alloys (AZ91D, AM60B) perform 100 - 200x better than "old" alloys (AZ91B, AM60A)*
- *Why ?*
  - *Alloy chemistries modified*
  - *"Tramp" Element Content reduced*
    - *Iron (Fe)*
    - *Copper (Cu)*
    - *Nickel (Ni)*
  - *Internal Galvanic Effects Eliminated*