



## Technical Bulletin

# Galvanic Series of Metal Corrosion

Galvanic Corrosion Potential is a measure of how dissimilar metals will react when assembled in direct contact with each other in an electrolyte solution such as water. Metals close to another on this chart generally have a minimal corrosive effect on the corresponding adjacent metal in a system. However, the further apart the metals are on this chart, the more severe the effect will be on the corresponding system metals. The corroded metal will be the higher one on this chart.

Other factors include the conductivity (dissolved solids) of the electrolyte solution and the relative size of the anodic metal in relation to the cathodic metal. A higher conductivity is associated with more severe corrosion. A large anodic area relative to a small cathodic area is associated with a less severe effect.

This list represents the potential available to promote a corrosive reaction, however the actual corrosion in each application is difficult to predict. Best practice would suggest the use of a dielectric union where possible to prevent galvanic corrosion and subsequent failure of system components.

Anodic  
(least noble)  
Corroded



Cathodic  
(most noble)  
Protected

Magnesium  
Magnesium Alloys  
Zinc  
Beryllium  
Aluminum 1100, 3003, 3004, 5052, 6053  
Cadmium  
Aluminum 2017, 2024, 2117  
Mild Steel 1018, Wrought Iron  
HSLA Steel, Cast Iron  
Chrome Iron (active)  
430 Stainless (active)  
302, 303, 321, 347, 410, 416 Stainless Steel (active)  
Ni-Resist  
316, 317 Stainless (active)  
Carpenter 20Cb-3 Stainless (active)  
Aluminum Bronze (CA687)  
Hastelloy C (active) Inconel 625 (active) Titanium (active)  
Lead/Tin Solder  
Lead  
Tin  
Inconel 600 (active)  
Nickel (active)  
60% Ni 15% Cr (active)  
80% Ni 20% Cr (active)  
Hastelloy B (active)  
Naval Brass (CA464) Yellow Brass (CA268)  
Red Brass (CA230) Admiralty Brass (CA443)  
Copper (CA102)  
Manganese Bronze (CA675) Tin Bronze (CA903, 905)  
410, 416 Stainless (passive) Phosphor Bronze (CA521, 524)  
Silicon Bronze (CA651, 655)  
Nickel Silver CA 732, 735, 745, 752, 754, 757, 765, 770, 794  
Cupro Nickel 90-10  
Cupro Nickel 80-20  
430 Stainless (passive)  
Cupro Nickel 70-30  
Nickel Aluminum Bronze (CA630, 632)  
Monel 400, K500  
Silver Solder  
Nickel (passive)  
60% Ni 15% Cr (passive)  
Inconel 600 (passive)  
80% Ni 20% Cr (passive)  
Chrome Iron (passive)  
302, 303, 304, 321, 347 Stainless (passive)  
316, 317 Stainless (passive)  
Carpenter 20Cb-3 Stainless (passive), Incoloy 825 (passive)  
Silver  
Titanium (passive), Hastelloy C & C276 (passive)  
Graphite  
Zirconium  
Gold  
Platinum

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