



*Electrical &
Metal Products*

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GALVANIC CORROSION

Galvanic corrosion occurs when two dissimilar metals are in contact in the presence of an electrolyte, which is a medium through which an electrical current can flow (i.e. moisture). The rate of corrosion depends upon the amount and concentration of the electrolyte as well as the difference in electrical potential (anodic-cathodic relationship) of the metals as shown in Galvanic Series Chart to the right.

A highly anodic material in contact with a highly cathodic material will corrode much more quickly than two highly cathodic materials or when the materials used are closer together in the Galvanic Series Chart.

When corrosion does occur, the anodic material is the most likely to corrode, whereas the cathodic material is the least likely to corrode.

To reduce the likelihood of galvanic corrosion in a fastened joint, it's recommended to choose materials that are grouped together in the Galvanic Series Chart. If that's not possible, other recommendations are:

- 1) Select materials that are as close together as possible in the Galvanic Series Chart
- 2) Provide a barrier between the two metals, such as paint, non-metallic washer or gaskets
- 3) Design the fastener as the cathode so the cathodic area is small as compared to the anodic area
- 4) Use a metallic finish on the fastener that is close on the chart to the mating material

Corroded End (Anodic, Least Noble)

Magnesium
Magnesium Alloys
Zinc
Aluminum 1100
Cadmium
Aluminum 2024-T4
Steel or Iron
Cast Iron
Chromium-Iron (active)
Ni-Resist Cast Iron
Type 304 Stainless (active)
Type 316 Stainless (active)
Lead-Tin Solders
Lead
Tin
Nickel (active)
Inconel Nickel-Chromium Alloy (active)
Hastelloy Alloy C (active)
Brasses
Copper
Bronzes
Copper-Nickel Alloy
Monel Nickel-Copper Alloy
Silver Solder
Nickel (passive)
Inconel Nickel-Chromium Alloy (passive)
Chromium-Iron (passive)
Type 304 Stainless Steel (passive)
Type 316 Stainless Steel (passive)
Hastelloy Alloy C (passive)
Silver
Titanium
Graphite
Gold
Platinum

Protected End (Cathodic, Most Noble)