

GALVANIC CORROSION

Galvanic corrosion occurs when dissimilar metals are in contact in the presence of an electrolyte (conductive medium). Galvanic compatibility therefore is important if the application is in an environment where an electrolyte is present. For most office environments this is of little concern. However, if the application is in a marine environment or has contact with outside air then galvanic compatibility is necessary.

The table below shows a typical galvanic series. In general, the farther apart two metals appear on the chart the greater the tendency for corrosion.

ANODIC (Least Noble) End Material
Magnesium
Magnesium Alloys
Zinc
Aluminum
Cadmium
Aluminum 17ST
Steel or iron
Cast iron
Chromium-iron (active)
Ni-Resist
18-8 Chromium-nickel-iron (active)
18-8-3 Chromium-nickel-molybdenum-iron (active)
Lead-tin solders
Lead
Tin
Nickel (active)
Inconel (active)
Hastelloy C (active)
Brasses
Copper
Bronzes
Copper-nickel alloys
Monel
Silver Solder
Nickel (passive)
Inconel (passive)
Chromium-iron (passive)
18-8 Chromium-nickel iron (passive)
18-8-3 Chromium-nickel-molybdenum-iron (passive)
Hastelloy C (passive)
Silver
Carbon and graphite
Platinum
Gold
CATHODIC (Most Noble)

MATERIAL PROPERTIES

Material	BeCu	BeCu HT	Stainless Steel	Steel
Type	C17200 1/4H	C17200 H	304	ASTM A366
Yield Strength (Mpa)	410-550	710	329	280
Tensile Strength (Mpa)	520-610	780	673	330
Elastic Modulus (Gpa)	125-130	125-130	190	207

BERYLLIUM COPPER FINISH OPTIONS

- Silver plate per QQ-S-365 Type III Grade A
- Good corrosion resistance but will tarnish. Provides excellent solderability and is highly conductive. Grade A implies a chromate post treatment to improve tarnish resistance.
- Copper Plate per Mil-C-14550, Class 2
Usually used as an undercoat for corrosion resistance.
- Gold plate per Mil-G-45204, Type 1 (99.7% gold minimum), Class
Exceptional corrosion resistance with moderate wear.
- Nickel plate per QQ-N-290, Class 1, Grade G or F
Excellent corrosion protection along with high hardness for wear and low friction.
- Zinc plate clear chromate, per ASTM-B-633 Fe/Zn 8
- Zinc plate yellow chromate, per ASTM-B-633 Fe/Zn 8
- Ebanol plate per Mil-C-139234 for steel or Mil-F-495 for copper. Decorative coating with little corrosion protection
- Tin plate per Mil-T-10727
Good corrosion resistance but will tarnish over time
Electroless Nickel Plate per Mil-C-26074 Class 1, Grade B Excellent corrosion protection along with good electrical conductivity and low friction.

ALUMINUM FINISH OPTIONS

- Chemical film (gold) per Mil-C-5541, Class 1A or Class 3 Chemical Film (-Clear) per MIL-DTL-5541, Class 3, Type II
Other commonly used names include: Alodine, Alochrom, Iridite. Note: may increase surface friction; dry film lubricant can be applied prior to Card Lok actuation to prevent sticking.
- Anodize (soft), per Mil-8625, Class 2, Type II
Good corrosion resistance with medium abrasion resistance
- Anodize (hard), per Mil-8625, Class 2, Type III
Excellent corrosion and abrasion resistance.
- Nickel plate per QQ-N-290, Class 1, Grade G Bright Excellent corrosion protection along with high hardness for wear and low friction.
- Dry film lube per Mil-L46010.
Typically applied to hard black anodize to reduce friction and increase force output.
- Electroless Nickel Plate per Mil-C-26074 Class 1, Grade B Excellent corrosion protection along with good electrical conductivity and low friction.

STAINLESS STEEL FINISH

- Passivation per Mil-S-5002
Not a plating or a coating, it is a cleaning process that removes residue from manufacturing operations and enhances the natural corrosion resistance of stainless steels.

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