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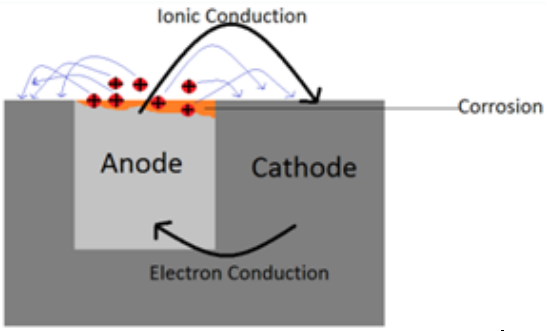
Preventing electrolysis and why we anodise our channel.

Electrolytic Corrosion (Electrolysis) occurs when dissimilar metals are in contact in the presence of an electrolyte, such as water (moisture) containing very small amounts of acid. The dissimilar metals set up a galvanic action that results in the deterioration of one of them. The following is a list of the more common commercial metals, sequenced according to what is known as the "Galvanic Series":



The Galvanic Series

1. Aluminium	7. Tin
2. Zinc	8. Lead
3. Steel	9. Brass
4. Iron	10. Copper
5. Nickel	11. Bronze
6. Stainless Steel 400	12. Stainless Steel 300

When any two metals in this list are in contact, with an electrolytic present, the one with the lower number is corroded. Each metal is corroded by all that follow it. The galvanic action increases as the metals are farther apart in the Galvanic Series. It is not always true that there is greater corrosion the further down the scale one goes. In certain cases one metal immediately following another may be very corrosive.
In other words, when two different metals are in contact with each other in the presence of moisture, there will be a flow of current from one metal (the "anode") to the other metal (the "cathode"), and one will be eaten away, or disintegrated, while the other (the "cathode") will remain intact.

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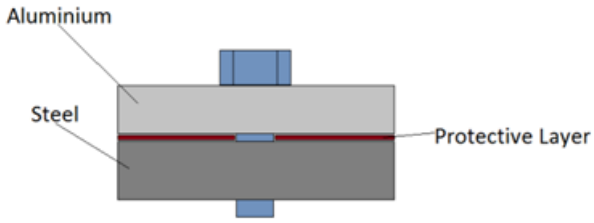
Preventing Electrolysis

One of the most important facts that an architect should know about a metal or an alloy is its reaction with other metals or alloys with which it may be in contact. This data is given in the Galvanic Series.
An important point to remember in utilising the Galvanic Series is that moisture is the chief problem in this type of corrosion, and moisture depends a great deal upon climate. In the desert, electro chemical action will be at a minimum. On the seacoast the action will be much greater, not only because of the ever-present moisture, but also because of the salt.
Some means of separating dissimilar metals must therefore always be found. This can be as simple as a low-tac tape or Bitumen paint preventing two surfaces touching each other.



Anodising (Dying)
The most common anodising process, for example sulphuric acid on aluminium, produce a porous surface which can accept dyes easily. The number of dye colours is almost endless; however, the colours produced tend to vary according to the base alloy. Though some may prefer lighter colours, in practice they may be difficult to produce on certain alloys such as high-silicon casting grades and 2000-series alloy. Another concern is the "lightfastness" of organic dyestuffs—some colours (reds and blues) are prone to fading. Black dyes and gold produced by inorganic means they are more lightfast. Dyed anodising is usually sealed to reduce or eliminate dye bleed out.
Alternatively, metal can be electrolyically deposited in the pores of the anodic coating to provide colours that are more lightfast. Metal dye colours range from pale champagne to black.
Alternatively the colour may be produced integral to the film. This is done during the anodizing process using organic acids mixed with the sulphuric electrolyte and a pulsed current.
Splash effects can be created by dying the unsealed porous surface in lighter colours and then splashing darker colour dyes onto the surface. Aqueous and solvent based dye mixtures may also be alternately applied since the colour dyes will resist each other and leave spotted effects.

Sealing
Acidic anodising produces pores in the coating, these pores can absorb dyes and retain lubricants, but can also be avenue for corrosion. These pores are usually sealed after dyeing to increase corrosion resistance and dye retention.

Cleaning
Anodised aluminium used in areas that are exposed to the elements should be cleaned regularly.

Environmental impact
Anodising is one of the more environmentally-friendly metal finishing processes. The by-products do not contain heavy metals, halogens or volatiles. The most common anodizing effluents are aluminium hydroxide and aluminium sulphate, these are however recycled for the manufacturing of alum, baking powder, cosmetics, newsprint and fertilizer or used by industrial wastewater treatment systems.

Should any problems arise please don't hesitate to contact us through the following ways:-

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