

Aluminum Cathode Information Sheet

History:

Aluminum cathodes have been used since the 1980's to replace lead cathodes, lead tanks, and lead cooling coils in the anodizing process. There are a number of benefits to using aluminum cathodes to replace lead. First it removes a contributing source of lead to the waste stream. And secondly, it is much more efficient in the transfer of current for the anodizing process. The more conductive aluminum metal gives lower voltage for a given current density providing energy savings. The design and spacing allows for more uniform anodic films.

The anodizing process is based on symmetry. The proper spacing of the cathode material provides this symmetry delivery of electricity. The design for installation of the aluminum cathode material will give reduced variation in anodic film thickness within the loaded flight bar. This translates to less anodic film thickness variation and more uniform colors.

The aluminum used for cathodes is typically extrusion to provide the necessary square footage to provide the correct ratio of three to one, anode to cathode.

Design and Principle:

1. A survey of anodizers was completed to review typical failure of aluminum cathode bars. These bars ranged from flat bars to long finned extrusions. Typical failure is burn thru of the back wall and the base of the fin where it joins the back wall.
2. The result of our survey is the design of cathode bar principle of perfect symmetry shown in the print. The fins, thickness, height are all .375 inches thick. This symmetry maintains the current flow. Surface area is increased while weight and cost are decreased.
3. This fin design results in less metal loss or cost than long fin extrusion typically used to increase surface area. The shorter fin saves tank space. This design provides twice the usable cathode area than flat bar or sheet for cost saving. The thicker metal contributes to the long cathode life.

Specifications:

Alloy 6063, T-6 temper for maximum corrosion resistance while maintaining current flow.

Availability:

Stock lengths are 96 inches. Custom lengths are available on request. We can cut and drill to length for a nominal fee.

Custom Cathode Header Assembly:

We manufacture custom cathode header assemblies. Our header sizes are 1 x 3 inch and 1.5 by 4 inch solid aluminum in alloy 6063. The cathode header systems are assembled with a proprietary fastening system using 316 SS fasteners. Quotations are available on request.

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