AMERICAN CARBON COMPANY

Why Trivalent Chrome Should Be On Your Radar

For many years, decorative hexavalent chrome Cr(VI) process has been a necessary evil. Yes, it creates an exceptionally durable corrosion resistant finish. One that can be both decorative and utilitarian in nature. But that may be where the true advantages end. The hexavalent chromium process suffers from low cathode efficiency, poor metal distribution, and lack of coverage around holes. It is also quite work-space unfriendly with the numerous chemicals [chromic acid (CrO3) and sulfate (S04)] and lead anodes which results in creating significant by-product waste for the environment. The low cathode efficiency of the hexavalent chrome results in the poor coverage in low current density areas and higher buildup in high current density areas. This imbalance can be corrected by overplating and grinding or adding auxiliary anodes. Both solutions however add time, cost, and complexity to the system. Due to the many drawbacks and infrastructure requirements of hexavalent chrome, it is best suited for very large mass produced and dare we say “simpler” assembly line parts.

Perhaps the most compelling argument to switch away from this system is the current regulatory markets. If you are currently purchasing hexavalent chromed parts, consider yourself to be in the twilight of this specific coating process. The EU has already all but eliminated hex chrome from its supply chain with regulation placing an official sunset in 2021. The United States will not be far behind with most states banning new hex chrome facilities and highly regulating existing operations. A complete ban is likely in the not so distant future. Proactive product are already developing and refining alternate solutions. One such solution that has made technological advances in recent years is trivalent chrome or Cr (lll).

Regardless of the future challenges hexavalent chrome facing in the near future, there are compelling reasons to consider switching to a trivalent coated product. First off, trivalent chrome is not the new “green” solution to a dirty problem, no it has been around for over 30 years providing corrosion control to exposed exterior metal in the trucking industry - and we all know what road salt does to metal. That point alone should add credibility to the trivalent chrome process. From a production standpoint trivalent is significantly easier to work with. Operationally, a correctly set up trivalent chrome system is very forgiving, with better throwing power from the anodes, indefinite electrolyte life, and easy to overcome current interruption (or the unfortunately white wash from hex chrome).

The covering power and uniform coating thickness characteristics are in our mind what makes trivalent chrome really shine. Using a tri chrome process you will likely eliminate auxiliary anodes for plating difficult geometries. This allows use of standard shaped anodes to coat a multitude of parts. But if you are looking al long runs of complex parts, then the sky is the limit for the complexity of the anode to create. Anode construction is often seen to be an intimidating and expensive endeavor, we at American Carbon don't believe this has to be the case. Our simple approach will get you set up with the correct anodes to start your trivalent chrome process.

If you are a product manager, talk to your current supplier about their process and start the dialogue as to when they will begin the switch over to trivalent chrome. And when you do, recommend they look at American Carbon anodes for their trivalent anode needs.

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