TRIVALENT CHROMIUM PRETREATMENT (TCP) STATE OF THE ART

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Trivalent chromium pretreatment (TCP) developed by the Navy is commercially available and being implemented in applications in DoD and commercially. One shortcoming has been the performance of TCP by itself on high-copper aluminum alloys. These alloys are difficult to protect from corrosion and prone to pitting. They are also very sensitive to variations in processing, leading to variable TCP performance. This variability and the overall lower performance of TCP compared to good chromate conversion coatings has limited the implementation of TCP for some users.

In an effort to reduce the effect of processing variability and close this performance gap with chromate conversion coatings, modified versions of TCP were developed by NAVAIR and its licensees. Modifications have been focused on two areas: (1) improving the bare corrosion resistance of TCP on high-copper aluminum alloys which have been processed by a variety of methods, including alkaline chemical milling, acidic etching, mild acidic etching, and non-etching cleaning, and (2) improving painted corrosion performance with non-chromated primers.

The relative performance of standard and modified TCP applied to aluminum alloys processed by a variety of methods will be presented and discussed.