CHEMEON™
SURFACE TECHNOLOGY

MIL-SPEC Applications to Replace Hex Chrome on Non Aluminum Substrates

February 2017

Whether it's called sodium dichromate, Cr6, Alodine, or simply hex chrome, hexavalent chromium has been the de facto source for military grade corrosion protection. Because hexavalent chrome is a known carcinogen, that protection comes at a price to health and industry. The EU initiative to ban hexavalent chrome is less than one year away. CHEMEON Surface Technology's mission in replacing hexavalent chrome has made the company a global leader in product and process development of MIL-SPEC and Military Grade replacements for hexavalent chrome.

To accommodate the myriad of ways in which prime contractors, military, architectural, medical and the automotive industry apply coatings, CHEMEON offers the widest variety of application methods for use on aluminum, titanium, magnesium, galvanized steel and tin. The following details the Application of CHEMEON TCP-HF on Non-Aluminum Substrates.

CHEMEON TCP-HF can be applied on non-aluminum substrates, providing a wide variety of benefits. CHEMEON TCP-HF prevents darkening on nickel and electroless nickel, while also providing an excellent adhesive base for topcoats. It can also be used as an anti-tarnish agent or when used in conjunction with other products, such as paints and powder coatings, it results in superior corrosion resistance.

Applications: Zinc, Zinc Alloys, and Galvanic Coatings

For optimal results on zinc-plated substrates, CHEMEON TCP-HF should be applied immediately after the plating takes place. After thorough rinsing, immerse the part in a 50% CHEMEON TCP-HF bath at an elevated temperature (120°F) for 5 minutes. Rinse again in a clean rinse and either bake or dry off with an air hose.

Existing Zinc, Zinc Alloys, and Galvanic Coatings

For parts that have previously been treated with a zinc based coating, the surface needs to be cleaned and activated before treatment with CHEMEON TCP-HF. The cleaner should be a mild alkaline cleaner designed for zinc applications. The temperature should be maintained near 120°F. Rinse twice for 1 minute each before activating the surface. The first rinse can be warm (100°F) and the second rinse at ambient temperature. To activate the surface, immerse the substrate in a 10% nitric acid bath for 3 minutes. Again, rinse twice with rinses at ambient temperatures. It is important that the rinse immediately prior to the CHEMEON TCP-HF bath be kept clean. Immerse the parts in CHEMEON TCP-HF for 3-5 minutes at 120°F and 25%-50% by volume. One or two brief rinses, 5-15 seconds, to remove excess CHEMEON TCP-HF are suggested. Dry in an oven or with an air hose.

Magnesium, Magnesium Alloys, and Magnesium Die Castings

Magnesium substrates should be cleaned prior to treatment with CHEMEON TCP-HF. The cleaner of choice should be Mg-specific and very alkaline with a pH above 12. The temperature of the cleaner should be maintained at the low end of its operating range. Immersion time will vary with the cleaner. Two to three tap

water rinses prior to CHEMEON TCP-HF are recommended. The first rinse should have a pH of 8 or greater. The rinse immediately prior to CHEMEON TCP-HF bath should be very clean. The CHEMEON TCP-HF bath should be operated at 25%-50% by volume at ambient temperature (650°F-120°F) with a contact time of 3-5 minutes. One or two brief rinses, 5-15 seconds, to remove excess CHEMEON TCP-HF are suggested. Dry in an oven or with an air hose. Drip-drying is not recommended.

Titanium

Titanium should be cleaned with a mild cleaner such as CHEMEON Cleaner1000 or other titanium- specific chemistries. Rinse the surface to remove the surfactants and other cleaner constituents. Etch the surface with an acid/fluoride based etch followed by two rinses. Immerse in a 50% CHEMEON TCP-HF bath at an elevated temperature (100°F -120°F) for 5 minutes. Finally, rinse in one or two brief rinses then dry in an oven.

In summation, CHEMEON Surface Technology replaces sodium dichromate and hexavalent chrome with MIL-SPEC and Military Grade coatings that protect against corrosion, promote greater adhesion, and are safe to humans and the environment.

CHEMEON offers Spray, Brush-On, Touch-Up Pen, Immersion and Ready To Use applications for CHEMEON's MIL-SPEC and Military Grade coatings. These varied applications protect against corrosion while replacing sodium dichromate and hex chrome.

CHEMEON TCP-HF (Hexavalent Free) is approved under MIL-DTL-81706 and MIL-DTL-5541 and can be applied via Immersion, Brush-On, Wipe On, Spray and via the convenient and safe CHEMEON Touch-Up Pen for surface scratch and patch repair. The MIL-SPEC CHEMEON TCP-HF SP is designed specifically for spray applications. For applications where surface preparation cannot include removing oxides from the surface, the Military grade CHEMEON TCP-NP (No Prep) fills the bill. And for ease of application CHEMEON TCP-HF RTU (Ready To Use) is pre mixed and can be applied directly from 5 gal, 55 gallon, tote, spray bottles or touch-up pen.

About CHEMEON Surface Technology

CHEMEON Surface Technology is the only Woman Owned Small Business in the world that is licensed by the US Navy to manufacture and provide MIL-SPEC QPD/QPL Hex Free/Trivalent Chromate Conversion Technology. CHEMEON's patented and proprietary chemistries are internationally recognized for providing environmentally responsible hard material, surface engineering treatments and solutions.
Learn more at: www.chemeon.com

If you would like further information on the content of this article/document, please contact us at info@chemeon.com or call (888)782-8324, or, contact a CHEMEON partner of your choice from the list below:

- Aero Colors Paint- Lake City, FL – 386-755-5560
- BroCo Products - Cleveland, OH – 216-531-0880
- Chemetall NA - New Providence, NJ – 908-464 -5571
- Dipsol of America – Livonia, MI – 734-261-0633
- Dynamix – Markham, ON 905-477-0900
- Electroplating Consultants International – Broken Arrow, OK – 918-455-4411
- Elite Surface Technologies – Clayton South, AU +61-39768-3860
- Hubbard-Hall – Waterbury, CT - 866-441-5831
- Madison Chemical – Madison, IN – 812-273-6000
- Miles Chemical – Arleta, CA – 818-504-3355
- Os-Tech, Dallas, TX – 972-231-1522
- Plating Specialists Inc. – Fort Thomas, KY - 800-488-3967
- Ronatech C2C – Carlsbad, CA – 800-928-9904
- Techmatic Inc. –Nashville, TN – 615-256-1416