

ChromateCheck™ Swabs

A Rapid Screening Test for Surface (CrO₄²⁻) Ions

BACKGROUND

Hexavalent chromium is recognized as a carcinogen. It has been used in a variety of products including conversion coatings (used in plating) to enhance corrosion protection, for appearance and as an adhesion film for organic coatings. Recent RoHS directives ban the use of hexavalent chromium targeting primarily corrosion resistant coatings applied to plating. Although there is no universal replacement for Cr⁶⁺, trivalent chromium is the most common replacement. The trivalent chromium conversion coating is not considered to be as hazardous as the hexavalent chromium product. A number of conversion coatings have been developed with trivalent chromium and provide acceptable corrosion resistance. Some of these products may contain Cr⁶⁺ as a contaminant (usually small amounts).

PRODUCT

ChromateCheck™ Swabs are a rapid screening test for the detection of chromate (CrO₄²⁻) ions. The test is specific for hexavalent chromium and can detect 1 to 2 micrograms on a solid surface. The test does not detect trivalent chromium and can be used to distinguish Cr³⁺ from Cr⁶⁺. In order to determine total chromate (Cr³⁺ and Cr⁶⁺) it is necessary to oxidize the test sample with peroxide or another oxidizing agent.

METHOD

1. Activate the swab by crushing at two points indicated on the barrel of the swab and shake vigorously for 30 seconds to mix the reagents .
2. Apply gentle pressure to the swab until liquid is at the tip.
3. Continue to squeeze the Swab gently and Rub the surface for about 30 seconds to 1 minute.

INTERPRETATION

If the tip of the swab turns light pink/purple to purple, hexavalent chromium is present. There is a possibility that trivalent chromium is contaminated with hexavalent chromium as well as some other contaminants. Usually the level of contamination is reported to be low. If the hexavalent chromium contaminant concentration is high enough (greater than 1 microgram in the area tested) the swab will turn light pink/purple. The lower the amount of Cr⁶⁺, the lighter the pink/purple color that develops on the swab. See the color chart in applications note CR-3.