

CONTROL TEST - CHROMATE PASSIVATION

Application

This test method is used to determine whether zinc or cadmium-plated and chromate passivated components have been adequately rinsed after processing by checking the level of chromate present.

Note: This test method is used to monitor chromate as part of the program to minimize the risk of chromate dermatitis.

Apparatus and Materials Required

Kessler Tubes

25 mm diameter x 150 mm long

Beaker

500 mL

Graduated Cylinder

100 mL

Dephenylcarbazide

Reagent grade

Ethyl Alcohol

Reagent grade; CAUTION: Low flash point

Phosphoric Acid

Concentrated: Reagent grade

Potassium Dichromate

Reagent grade

Distilled or Deionized Water

10 ppm max total dissolved solids (ASTM D1888)

Solutions Required

Diphenylcarbazide Solution

1 % of solution in ethyl alcohol

Date	Action	Revisions
2001 01 31	Revised	Editorial – no technical change A. Cockman
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Phosphoric Acid Solution

4 % by volume

Standard Chromate Solution

Preparation: Dissolve 0.136 g of potassium dichromate in distilled water and make up to 1 liter. Take a 10 mL sample of this solution and dilute to 1 liter. This solution represents the equivalent of 1 part per million of chromate.

Procedure

1. Take a sufficient number of parts in the 'as used condition' to give a test surface area of 5000 +/- 1000 mm².
2. Suspend the parts in 100 mL of distilled or deionized water at 40 +/- 2 °C for a minimum time of three (3) minutes. Agitate gently by swirling.
3. Remove the parts from the water, then fill a Kessler tube to three-quarters full with this solution, add 5 mL of the 4 % phosphoric acid followed by 2 mL of the 1 % diphenylcarbazide solution - shake and allow to stand for 5 minutes.
4. Fill a Kessler tube to three-quarters full with the standard chromate solution, add 5 mL of the 4 % phosphoric acid followed by 2 mL of the diphenylcarbazide solution - shake and allow to stand for 5 minutes (min).
5. After allowing the solution to stand for five (5) min to allow a stable color complex to develop, compare the colors developed in the solution against a white background.

Evaluation

The test solution is compared to the blank solution:

No color change - Chromate absent.

When a color change is observed, compare with the standard 1 ppm Chromate Solution.

Color less intense than Standard Solution - less than 1 ppm Chromate present.

Color equivalent to Standard Solution - equivalent to 1 ppm Chromate present.

Color more intense than Standard Solution - Chromate present in excess of 1 ppm.

Chemicals, materials, parts, and equipment referenced in this document must be used and handled properly. Each party is responsible for determining proper use and handling in its facilities.