

IS IT HEX-FREE OR NOT?

“FALSE-POSITIVES” FROM TRIVALENT CHROMATES ON ZINC

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More and more, zinc platers are being required to certify through independent testing laboratories that the trivalent chromates they're using are producing coatings that are completely free of hexavalent chrome. The problem is that the presence of hexavalent chrome can be falsely indicated by the laboratory, causing the plating shop difficulties with customers and the added expense of retesting. These “false positives” are increasingly common. Ask any lab manager or technical service representative who is responsible for meeting strict automotive requirements for hex chrome-free plating, such as GM 3034 and Delphi 900359.

There are four probable reasons for a “false-positive” reading (and one case for a legitimate positive reading) on coatings produced from trivalent chromates that are certified to contain no Cr6+, such as Columbia Chemical SpectraMate 25, Tri-V 120 and Tri-V 121:

Interference From Topcoats/Sealers

Organic and inorganic topcoats can interfere with testing and result in false-positives. Ideally, parts really should not be subjected to testing for hexavalent chrome after a sealer has been applied. The sealers that cause the most problems are:

Organic- Lacquers

Inorganic- Silicates

Lubricants- Waxes, torque modifiers

Use of Old/Contaminated Reagents

Using old or contaminated diphenyl carbazide can cause inaccurate results. This is the indicator used as the tracer to identify the presence of hexavalent chromium in the test solution.

Lack of Filtration

In some cases, the test solution may require filtration due to turbidity. Improper filtration or lack of filtration can cause false-positive results.

Excessive Boiling

Boiling the test part is included in the testing procedure; however, excessive boiling and concentrating the test solution can cause false-positives.

Use of a Hexavalent Chromate in the Same Plating Line

The practice of running both hexavalent and trivalent chromates in the same plating line is still very common worldwide. This can cause parts processed with the trivalent chromate to show the presence of hex-chrome and fail the test. It only takes a few ppm of hex-chrome in a common rinse tank to cause problems. In this case, the test may be accurately reporting the presence of hex-chrome and not reporting a “false- positive.”

Being aware of these pitfalls that can occur when testing parts for hexavalent chrome may help to avoid the panic that sets in when a “false-positive” reading is reported. Testing laboratories are generally interested in obtaining the most accurate results possible for their customers. Therefore, they will usually discuss the finer points of the testing methods along with ways to improve what they are doing.