

Good Practice Sheet for Uses of Chromates

D3 Adjustment of treatment baths with chromates¹

This sheet will help employers to comply with the requirements of EU Directive 2004/37 and the terms of the REACH authorizations for uses of chromates. Working with chromates may cause cancer. This sheet describes good practice to reduce exposure. It covers the points that should be followed to reduce exposure. It is important to follow all the points, or use equally effective measures. This document should be made available to all persons who may be exposed to chromates in the workplace so that they make the best use of the control measures available.

The Process

This GPS covers the (re)adjustment of tanks containing chromates solution or electrolyte by addition of chromates.

Chromates are used as such or in formulations in solid (dry) or liquid (aqueous) form maintain treatment baths.

Solid chromates are supplied in drums or bags as crystals or flakes. The solid chromates are dissolved either directly into the mixture in the treatment tank or prepared into an aqueous solution (e.g. in a freestanding vessel) and then added to the tank. Alternatively, a pre-prepared aqueous chromate solution delivered in suitable packaging (e.g. tanks or IBC containers) is added to the tank via pipework or manual dosing (continuously or as needed).

Preparatory steps for the re-adjustment of the chromate solution including decanting, weighing and (pre-) mixing of either solid or aqueous solutions of chromates in a manual process are conducted only when the amounts of chromates in use are small.



This photo shows adjustment of bath with chromium trioxide.

Equipment Design and Access

Pre-mixing of solid chromate solution:

- ✓ The mixing vessel has local exhaust ventilation system (LEV) and a manual or automated stirrer.
- ✓ The water supply to the mixing vessel is designed to prevent splashing of chromates.
- ✓ The speed of the mixer is sufficiently low to prevent splashing.
- ✓ A small amount of water or electrolyte is first added to the vessel. The dry chromates are then carefully added to the mixing vessel close to the LEV system.
- ✓ The empty container is flushed with low pressure water to remove residual chromates, and the rinsate is returned to the mixture. Other materials are then added, avoiding splashing.

Addition of solid chromates to treatment tank:

- ✓ LEV must be provided at the dosing point.
- ✓ The process should be automated as far as possible to minimize worker exposure. When chromates are dosed direct to the plating tank, the plating tank must be in maintenance mode.

Addition of liquid (aqueous) chromates to tank:

- ✓ Chromates are delivered in IBCs. Prior to use, IBCs should be fitted with a (suction) lance that is secured against unauthorized removal and a splash guard.

¹ Chromates may include the following substances: Chromium Trioxide (S1), Dichromium tris(chromate) (S2), Potassium dichromate (S3), Sodium dichromate (S4).

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Chromates Emissions

Chromates in solid (dry) form can generate dust. Exposure to chromate dust is possible when drums or bags are opened and during transfer from the packaging to the mixing vessel or plating tank. See GPS C16.

Risk Management Measures - Workers

- LEV must be provided when exposure to dust and/or aerosols is possible. LEV must be regularly inspected and maintained to ensure full working order.
- Equipment must be regularly inspected and rinsed to remove residual chromates, which appears as colored traces on the equipment. See GPS D4.
- Implement appropriate measures (e.g. provision of local cleaning facilities and hazardous waste management bins) to prevent cross-contamination between equipment and PPE.
- Restrict access to the process area to permitted workers only.

Risk Management Measures - Environment

- The air extraction system must discharge to atmosphere via a filtration or scrubber unit capable of removing chromates effectively and to as low as reasonably practicable levels.
- Wastewater containing hexavalent chromium should not be discharged to surface or groundwater, but treated to effectively remove hexavalent chromium prior to release to the environment or disposed of as hazardous waste.
- Floors, drains and equipment in process areas and chemical and waste storage areas should be sealed and regularly maintained to ensure integrity.

Personal Protective Equipment (PPE)

To minimize potential exposure to chromates, all persons conducting adjustment work at the plating or treatment line must wear:

- chemical resistant eye protection
- face mask in case of splashing risk
- in case of handling solid (dry) chromates: Air-fed respirator / full-face filter mask with P3 filter
- protective gloves
- safety clothing / footwear.

GPS E1 and your supplier's extended SDS provide relevant information on PPE.

Training and Supervision

All persons with access to the plating or treatment line must be instructed about the risks of working with chromates, the safe way of handling chromates and use of PPE and other control equipment. Workers must be properly trained and equipped to carry out their duties, and to safely cease such duties as needed. Adequate supervision must be available at all times.

Monitoring

Adequate monitoring data must be available to evidence that potential exposure of workers and potential environmental release are maintained to as low as reasonably practicable level. Expert input is advisable.

Monitoring should be carried out at least annually. Downstream users may reduce the frequency of measurements once it is demonstrated that exposure of humans and releases to the environment has been reduced to as low a level as technically and practically possible and that the risk management measures and operational conditions correspond to the exposure scenarios and function appropriately.

GPS E2 provide further information on monitoring, including reference to relevant standards.

Other Relevant Good Practice Sheets

Other GPS are also likely to be applicable. A full list can be accessed [Link](#).

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