

Good Practice Sheet for Use of Chromium Trioxide

D3 Adjustment of plating or treatment baths with chromium trioxide

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 chromium trioxide. Working with chromium trioxide 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 chromium trioxide 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 chromium trioxide solution or electrolyte by addition of chromium trioxide.

Chromium trioxide is used as such or in formulations in solid (dry) or liquid (aqueous) form at downstream users to maintain treatment baths.

Solid chromium trioxide is supplied in drums as crystals or flakes. Downstream users either dissolve solid chromium trioxide directly into the mixture in the treatment tank or pre-mix it (e.g. in a freestanding vessel) and then add the aqueous solution to the tank. Alternatively, aqueous chromium trioxide solution delivered in tanks or IBC containers is added to the tank (continuously or as needed) via pipes or manually.



This photo shows adjustment of bath with chromium trioxide.

Equipment Design and Access

Pre-mixing of solid chromium trioxide solution:

- The mixing vessel is normally open for addition of chromium trioxide and other raw materials. ✓
- 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 chromium trioxide. ✓
- 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 chromium trioxide is then carefully added to the mixing vessel close to the LEV system. ✓
- The empty container is flushed with low pressure water to remove residual chromium trioxide, and the rinsate is returned to the mixture. Other materials are then added, avoiding splashing. ✓

Addition of solid chromium trioxide 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 chromium trioxide is dosed direct to the plating tank, the plating tank must be in maintenance mode. ✓

Addition of liquid (aqueous) chromium trioxide to tank:

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

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Chromium Trioxide Emissions

Chromium trioxide in solid (dry) form can generate dust. Exposure to chromium trioxide dust is possible when drums are opened and during transfer from the drum to the mixing vessel or plating tank. Splashing can occur when adding water to chromium trioxide or vice versa. Residual chromium trioxide on equipment surfaces might be possible in some systems. Appropriate risk management measures should be adopted, as necessary.

Risk Management Measures - Workers

- LEV must be regularly inspected and maintained to ensure full working order.
- Equipment must be regularly inspected and rinsed to remove residual chromium trioxide, which appears as dark red traces on the equipment. See GPS D4.
- Implement appropriate measures to prevent cross-contamination between equipment and PPE.
- Restrict access to the process area to permitted workers only by appropriate measures.

Risk Management Measures – Environment

- The air extraction system must discharge to atmosphere via a filtration or scrubber unit with State-of-the-Art chromium trioxide removal efficiency.
- 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 managed as a hazardous waste.
- Floors, drains and equipment in process and chemical and waste storage areas should be sealed and regularly maintained to ensure integrity.

Personal Protective Equipment (PPE)

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

- Protective eye goggles.
- Face mask in case of splashing risk.
- In case of handling solid (dry) chromium trioxide P3 filter.
- Protective gloves.
- Acid-resistant clothing / footwear.

GPS E7 and your supplier's extended SDS provide relevant information on PPE.

Training and Supervision

All persons with access to the plating line must be instructed about the risks of working with chromium trioxide, the safe way of handling chromium trioxide 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 provided at all times.

Monitoring

Adequate monitoring data must be available to evidence absence of worker exposure and evaluate environmental release. GPS E1–E4 provide further information on monitoring. Expert input is advisable to ensure an appropriate monitoring program that also meets regulatory requirements.

A typical worker exposure monitoring program will include collection of 1 (or 2) personal measurement(s) during the re-adjustment work.

Monitoring should be carried out annually until there is adequate evidence that exposure is minimized. Monitoring may be reintroduced following significant changes to the system.