

Good Practice Sheet for Uses of Chromates

C7 Anodizing operations in an open tank with manual loading to bath with electric current¹

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 industrial, anodizing² of articles in one or more open tanks.

This process is realized by immersion in aqueous solutions containing chromates with application of an electric current.

Equipment Design and Access

The treatment system involves one or more open tanks and is designed to support parts or articles with varying dimensions. Workers have access to the treatment tank(s). Articles or parts are mounted on supports and transported through the treatment system manually.

During the oxidation process, the operator may have access to the tank.

The electrolyte remains in the tank throughout operations and the electric current to the tank is switched on when parts are lowered into the treatment tanks, and switched off when the parts are lifted from the tanks.

An open treatment system has the following features:

- ✓ Articles are mounted/dismounted in racks or a crane/hoist in an area near to the treatment tanks. The rack, crane or hoist is manually operated to transfer the articles through the treatment system.
- ✓ Continuous fixed LEV removes chromates mist or aerosols, which are generated during the anodizing operation, from above the tank(s).
- ✓ After immersion, rinsing takes place in separate rinsing tanks. The rinse water is treated in a waste water treatment plant or recycled.

Measures relevant for ancillary tasks are also described in separate GPS. A full list of GPS is available [Link](#).

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

² Anodizing means creation of a protective oxide layer. e.g. on aluminum the protective oxide layer is aluminum oxide

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Chromates Emissions

Chromates mist or aerosols can be released from the tanks. Residual chromates on equipment surfaces is possible.

Risk Management Measures - Workers

- Electrically interlocked control systems ensure the electric current to the treatment process can only be switched on when the extraction unit (LEV) is operating. If the exhaust system malfunctions/fails, the electric current to the process automatically switches off immediately.
- Electric current to the treatment tank is switched off when parts are lowered into or lifted from the tank.
- Use of a mist suppressant/foam layer is recommended to minimize chromates aerosols.
- The oxidation solutions are working above room temperature (between 35°C and 60°C), which prevent avoidable misting or aerosol formation. A temperature control system should be used on the bath to maintain temperature in this range.
- The LEV system must be tested regularly and comprehensively to ensure it is operating efficiently.
- Process equipment must be regularly inspected and rinsed to remove residual chromates. See GPS D4.
- Implement appropriate measures (e.g. provision of local cleaning facilities and hazardous waste management bins) to prevent cross-contamination from equipment and PPE to adjacent areas.

Risk Management Measures - Environment

- The air extraction system must discharge to atmosphere via a filtration or scrubber unit with capable of removing chromates efficiently and consistent with best practice.
- 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.

PPE

All persons accessing the treatment line must wear:

- respiratory equipment, the efficiency level of which to be determined based on risk assessment and monitoring results
- protective eye goggles or face shield
- protective gloves
- safety clothing / footwear.

GPS E1 and your supplier's extended Safety Data Sheet (SDS) provide relevant information on PPE.

Training and Supervision

All persons with access to the spray cabin 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, including reference to relevant standards.

Other Relevant Good Practice Sheets

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

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