

B2 Chromium plating operations in covered tanks or baths

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 industrial electroplating of articles with a surface layer of metallic chromium in one or more covered plating tanks. The plating line contains an aqueous chromium trioxide solution (electrolyte). Chromium plate is deposited on parts or articles in the tank(s) when an electric current is applied to the system. The treated parts are rinsed following plating.



Photographs show covered tanks used in rotogravure plating and continuous plating of hydraulic bars.

Equipment Design and Access

Covered plating systems comprise a plating tank which is covered by a lid and a closed storage tank, with a lid for maintenance and inspection. The chromium trioxide may be delivered to the plating system from a container via a flexible hose. Articles may be fed through the plating process automatically or with manual control during batch operations, or with a manual or automated crane. During continuous operation they are automatically fed through the process via a loading table. In either case, workers have no access to chromium trioxide during plating operations. A covered plating system must have all of the following features:

- The plant is designed so that workers cannot come into contact with chromium trioxide during and after plating. ✓
- The tanks are effectively covered, but may not be sealed. ✓
- Fixed local exhaust ventilation (LEV) is provided to efficiently remove chromium trioxide mist from the tank and maintain a negative pressure in the tank headspace. ✓
- Whenever the current is on during plating, the operator has no access to the plating tank. ✓
- Workers are remote from the tanks during operation apart from occasional visual inspection of the tanks. ✓
- Articles are fixed to/removed from grippers or racks or crane in a separate area. ✓
- Rinsate from the rinsing process is transferred to and from the rinse tank via a closed circuit. ✓

In case these features are not in place, this GPS does not apply, but another may. Measures relevant for ancillary tasks are also described in separate GPS. A full list of GPS is available at [link](#).

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Chromium Trioxide Emissions

Chromium trioxide mist or aerosols can be released from the tanks when the lids are opened. Residual chromium trioxide on equipment surfaces might be possible. Appropriate risk management measures should be adopted, as necessary.

Risk Management Measures - Workers

- Electrically interlocked control systems ensure the electric current to the plating process can only be switched on when the LEV is operating. If the LEV system fails, the electric current to the process automatically switches off immediately.
- The LEV system must be tested regularly and comprehensively to ensure it is operating efficiently.
- Electrically interlocked control systems must ensure the electric current to the plating processes can only be switched on when covers to tanks are on and lids are closed. If covers or lids are opened, the electric current to the process automatically switches off immediately.
- Process equipment must be regularly inspected and rinsed to remove residual chromium trioxide, which appears as dark red traces on the equipment. See GPS D4.
- Use of a mist suppressant is recommended to minimize chromium trioxide aerosols.
- Implement appropriate measures to prevent cross-contamination from equipment and personal protective equipment (PPE).

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, equipment in process, chemicals and waste storage areas should be sealed and regularly maintained to ensure integrity.

PPE

No access to the plating line occurs during normal operations. Therefore, no special PPE to protect against exposure to chromium trioxide is required. Chemical resistant clothing and eye goggles must be worn during visual inspections and when connecting the flexible hose to the chromium trioxide container.

GPS E7 and your supplier's extended SDS provide further 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 2 static measurements at each position of the plating line with potential for release of chromium trioxide during a normal production cycle. Personal monitoring may not be necessary when potential for exposure is shown to be negligible.

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.

Other Relevant Good Practice Sheets

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