

B3 Chromium plating operations in tanks or baths in an enclosed chamber and automated loading to bath

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 chambers enclosing plating systems and hoist lines.

Equipment Design and Access

The plating tanks, rinse tanks and hoist line are located within a chamber, separating the plating operation from the rest of the workplace. The plating tanks are typically open. Articles or parts are mounted/demounted to a hoist manually or automatically outside the chamber and fed by an automated conveyor system through the plating system via gates. Workers can only access the inside of the chamber for maintenance purposes.

An enclosed plating system must have all of the following features:

- The plating tanks, rinse tanks and hoist line are enclosed within a chamber. ✓
- Articles are mounted/demounted to the hoist in an area outside the chamber and automatically transported through the plating process via gates. ✓
- The entire plating process is carried out in the chamber. ✓
- Access to the chamber can only be gained via gates which are closed/locked when the plant is operational (i.e. the electric current to the process is on). ✓
- Workers only access the chamber for maintenance and cleaning purposes. ✓
- Local exhaust ventilation (LEV) is provided to efficiently remove chromium trioxide mist from the chamber. ✓
- The chamber is maintained under negative pressure when the plating system is operating. ✓

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](#).

B3 Chromium plating operations in tanks or baths in an enclosed chamber and automated loading to bath

Chromium Trioxide Emissions

Chromium trioxide mist or aerosols can be released from the tanks. Residual chromium trioxide on equipment surfaces is likely within the chamber. 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.
- Controls are in place to ensure access to the chamber is restricted when the plant is operational, including adequate clearance time after completion of a production cycle. Clearance time test should be determined via an appropriate test.
- 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 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.
- Full PPE is necessary when accessing the chamber for maintenance and cleaning purposes.
- 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.

Full PPE is necessary during cleaning and maintenance:

- Protective eye goggles.
- Protective gloves.
- Acid-resistant clothing / footwear.
- P3 filter.

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 a static measurement at the plating line (i) during a normal production cycle and (ii) after clearance time and (iii) adjacent to the outer face of each gate to the chamber 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](#).