Good Practice Sheet for Use of Chromium Trioxide

C1 Surface treatment with chromium trioxide in open tanks or baths (e.g. passivation, conversion coating, anodize seal) without electric current

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 surface treatment of articles in one or more treatment tanks. These processes (e.g. passivation, conversion coating, anodize seal) involve no electric current at the tank ('electroless'). The treatment line comprises a series of baths. The article is immersed in an aqueous solution containing chromium trioxide. A complex chemical reaction at the surface of the article occurs. The resulting surface has improved properties critical for function of the article (e.g. corrosion resistance, adhesion). The treated parts are rinsed in separate tanks.

Where surface treatments involve applying an electric current at the tank (e.g. chromic acid anodize), Downstream Users are referred to GPS C7.

Equipment Design and Access

The treatment tanks are open. Articles or parts are fixed to and removed from hoists, racks or added to baskets at a separate station and fed manually or by a conveyor system through the surface treatment system. Parts with varying dimensions are typically treated over short cycles. The process is normally carried out at temperatures up to 35°C and occasionally up to 95°C. The treatment system must have all of the following features: ✓

- Articles are prepared for the treatment process at a dedicated station in an adjacent/separate area. ✓
- No electric current is applied at the tank. ✓
- LEV is provided.[1] ✓
- The treated parts are rinsed in separate tanks as part of the process.

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.

Photographs show (left) racks of parts immersed in a surface treatment bath, (right) a basket of parts being removed from a surface treatment bath. The basket is tilted to allow better draining and to reduce dragout of process solution to the rinse tank.

[1] LEV may not be necessary for activities, including passivation as the final process step in batch processing (galvanizing is the process of applying a zinc coating to steel or iron by dipping into a bath of molten zinc), where the transfer of parts to and from the bath is automated such that workers are not required to carry out activities close to the bath and the concentration of CrVI in the bath is <0.2 wt.%.

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Chromium Trioxide Emissions

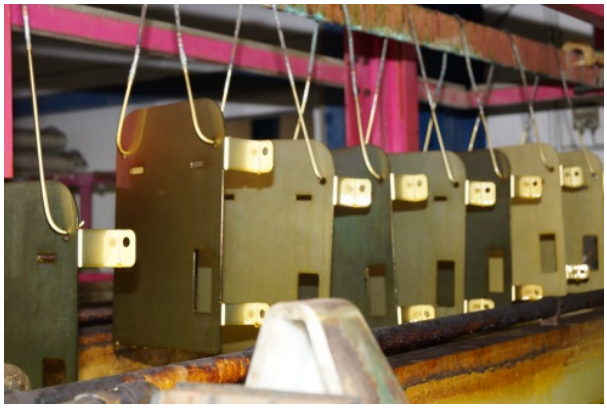
Residual chromium trioxide solution may be released from articles following treatment returning to the tank. Residual chromium trioxide on equipment surfaces might be possible. Appropriate risk management measures should be adopted, as necessary.

Risk Management Measures - Workers

- 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.
- Implement appropriate measures to prevent cross-contamination from equipment and 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 and equipment in process and chemical and waste storage areas should be sealed and regularly maintained to ensure integrity.



Photograph shows parts after surface treatment.

PPE

To minimize potential exposure to chromium trioxide, all persons accessing the treatment line must wear:

- Protective eye goggles.
- 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 treatment process 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 personal monitoring during a normal production cycle. Static measurement at the treatment line during a normal production cycle may support risk assessment.

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

For surface treatment processes that involve applying a current at the tank, refer to GPS C7.

Other GPS are also likely to be applicable. A full list can be accessed at link.

