

C17

Machining activities of chromated parts (following immersion/bath application of surface treatment containing chromate¹)

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

Machining operations, such as abrading, grinding or drilling of parts may be carried out on parts that have been surface treated with mixtures containing chromates. In such cases, due care is needed to prevent exposure to the dusts generated, which may contain chromates and other hazardous or flammable components. Wet processes or on-tool extraction are advised in order to minimise generation of dusts.

Drilling is generally either fully automated (e.g. robotic) or semi-automated with on-tool extraction and lubricants. Some manual drilling may still be conducted for a limited number of holes. Manual drilling is conducted wet or with extraction or both.

Abrading (as surface preparation before painting) is generally carried out in grinding booths which are fully contained booths with laminar down-flow, or on a portable semi-open booth. Abrading tools are equipped with on-tool extraction and a decontamination area is present at the exit of the cabin.

In case of repairs, abrading is done directly on the aircraft with no possibility to move it to a dedicated booth, using wet method or on-tool extraction.

Light abrading of small localised areas is typically carried out manually by means of glass fibre brush and/or dry abrasive paper for the purpose of bonding or for localised re-coating (repair and touch up). Some of these activities are carried out in cabins which are fully contained booth with laminar down-flow. For small parts activities are typically carried out in a contained dry-stripping cabin, with LEV or a vacuum hose applied adjacent to the abrading activity. Manual light sanding equipped with on-tool extraction is used directly on the aircraft (not in a dedicated booth).

Equipment Design and Access

Parts with varying dimensions are typically operated on. The process is normally carried out at room temperature. Metal fitting is generally but not only done at the work station using:

- Extracted workbench. ✓
- On-tool extraction or wet abrading when the component to be fitted cannot be moved. ✓
- In confined work area (e.g. wing tank) forced ventilation may be used as this also benefits thermal comfort. ✓

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

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

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Chromates Emissions

Materials containing chromates may be released during machining operations. Residual chromates on equipment surfaces and articles/parts might be possible after machining.

Risk Management Measures - Workers

Extraction units must be equipped with HEPA filters.

Cleaning due to contamination during the machining process is conducted under the same operational conditions and risk management measures as the machining activities.

Risk Management Measures - Environment

- The air extraction system must discharge to atmosphere via a filtration or scrubber unit 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

To minimize potential exposure to chromates, all persons performing machining activities wear:

- Half-face or full face mask with P3 filter for operations with a longer duration of activity.
- Full-face mask with P3 filter with or without air supply in small work areas without any localised control.

GPS E1 provide relevant information on PPE.

Training and Supervision

All persons with access to the machining process must be instructed about the risks of generating chromate dusts, the safe way of managing dusts 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. Annual programs of inhalation exposure monitoring for chromium (VI) through personal sampling must be implemented in combination with post-shift biomonitoring for chromium.

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 on monitoring, 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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