

E1 Monitoring of Workplace Exposure to Cr(VI) Stationary (Static Air) Measurements

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 purpose of this GPS is to set out the key requirements for measuring worker exposure to Cr(VI) in dusts or aerosols (also referred to as mists).

Need for Workplace Exposure Measurement

When Chromium trioxide is used, measurement data is needed to assess worker exposure. Worker exposure measurement data may be gathered in different ways, including personal measurements, static air measurements and biomonitoring. Static air monitoring can be part of an exposure measurement program where there is potential for exposure in the workplace to dusts or aerosols containing chromium trioxide.

Requirements for Static Air Exposure Measurements

Static air monitoring aims to evaluate how much exposure to Cr(VI) can occur at the workplace and so to help assess the potential for exposure in the course of a worker's duties. A purpose-designed sampling unit is fixed at the source of the emission or area in which worker exposure occurs, with the head of the sampling unit set in the breathing zone of the worker. Air is drawn through treated filters on the sampling unit at a specified flow rate. The filters separate the inhalable fraction of the dust and retain the Cr(VI). An accredited laboratory carries out analysis to quantify the Cr(VI) captured during sampling.

The LOD of the method needs to be sufficiently sensitive to quantify Cr(VI) in the workplace. A LOD should be $< 1 \mu\text{g}/\text{m}^3$ per sample or lower (if technically possible $0.025 \mu\text{g}/\text{m}^3$).

Frequency of Measurements

Static air exposure monitoring could be repeated at an appropriate frequency until adequate measurement data is available demonstrating worker exposure is minimized. The frequency of measurement may then reduce. However, new data will normally be required when any changes to the process occurs.

Guidelines and Standards

Relevant guidance and standards should be consulted when developing an exposure measurement program. A list of references is provided overleaf, but national legislation or guidance may also apply. Expert support is also advisable.

Monitoring Report

The report should include:

- ✓ A full description of the process being monitored.
- ✓ A description of relevant operational conditions and risk management measures in place.
- ✓ A map showing sampling locations.
- ✓ The detailed methodology used to obtain and analyse samples.
- ✓ A complete set of results and supporting data.

See GPS E5.

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Applicable Guidance and Standards

HSE MDHS 52/4. Hexavalent chromium in chromium plating mists. Colorimetric field method using 1,5-diphenylcarbazide and spectrophotometry or colour comparator.

<http://www.hse.gov.uk/pubns/mdhs/pdfs/mdhs52-4.pdf>

ISO SO 16740:2005 Workplace air -- Determination of hexavalent chromium in airborne particulate matter -- Method by ion chromatography and spectrophotometric measurement using diphenyl carbazide.

<https://www.iso.org/obp/ui/#iso:std:30432:en>

IFA-Arbeitsmappe 6665: Chrom(VI)-Verbindungen.

https://www.ifa-arbeitsmappedital.de/IFA-AM_6665

Other Relevant Good Practice Sheets

This GPS is one of three designed to explain the key requirements for measuring worker exposure to Cr(VI) in dusts or aerosols. Please also refer to the following GPS:

- E2 - Monitoring of Workplace Exposure to Cr(VI) by Personal Measurement.
- E3 - Monitoring of Workplace Exposure to Cr(VI) by Biomonitoring.

Please also refer to GPS E4 which explains requirements in relation to environmental monitoring.

Expert Support

Occupational hygienists specialize in developing and executing worker exposure monitoring programs. Support from a suitably qualified expert is advisable in relation to the specification and delivery of any program for workplace exposure monitoring.