Good Practice Sheet for Uses of Chromates

A2 Formulation – addition of liquid chromates[1] to mixtures

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

This GPS covers blending of liquid chromate (with or without additives) in solutions by formulators during the manufacturing of proprietary products or by downstream users during preparation of solutions for surface treatment. Solutions are supplied in sealed containers (IBC) or appropriate packaging.

Liquid chromate mixtures are transferred to and filled into the mixing vessel. This might be an open, manual process or an automatic, closed process. The mixing/blending of the preparation is performed within a mixing tank, often a closed or semi-closed system with automated mixing.

After mixing, the formulation is manually or automatically transferred into specified (ADR approved) containers or tanks or appropriate packaging.

If the substance is decanted, the process is not automated. Connecting the receiving vessel to the source vessel is done manually.

Downstream users either add the chromates directly into the mixture in the surface treatment tank or pre-mix it and then add the solution to the tank. The mixing vessel or treatment tank may be fed by automated loading or manually.

Equipment Design and Access

Formulation is preferentially carried out in a dedicated mixing vessel.

- The mixing vessel is normally closed with an opening for addition of liquid chromate solution and other raw materials.
- The mixing vessel has local exhaust ventilation (LEV), a manual or automated stirrer and optionally a pump to transfer the product to the containers.
- The water or solvent supply to the mixing tank is designed to prevent splashing of chromates.
- The speed of the mixer is sufficiently low to prevent splashing.
- LEV must be provided at the dosing point.

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

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Chromates Emissions

Chromate containing mist or aerosols might be released from the tanks when the lids are opened. Splashing can occur when adding additional components to chromates or vice versa. Residual chromates on equipment surfaces might be possible in some systems.

Risk Management Measures - Workers

- Flush residues from the drum to the vessel with low pressure water. Carefully add other raw materials / water to prevent splashing.
- LEV must be regularly inspected and maintained to ensure full working order.
- Regularly inspect and rinse equipment to remove residual chromates.
- Implement appropriate measures to prevent cross-contamination between equipment and personal protective equipment (PPE).
- Restrict access to the process area to permitted workers only by appropriate measures.

Risk Management Measures - Environment

- The air extraction system for the LEV must discharge to the 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 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.

Personal Protective Equipment (PPE)

To minimize potential exposure to chromates, all persons carrying out touch up operations must wear:

- protective eye goggles
- protective gloves
- sufficient resistant clothing / footwear adapted to the chemical risks of the mixture
- respiratory protection (half or full-face mask with P3 filter) when handling open drums.

GPS E1 and your supplier's extended Safey Data Sheet (SDS) provide relevant information on PPE.

Training and Supervision

All persons with access to the formulation/mixing area must be instructed about the risks of working with chromates, the safe way of handling chromates 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 that potential exposure of workers and potential environmental release are maintained to as low as reasonably practicable level. 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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