



Standard Guide for Safety and Health Requirements Relating to Occupational Exposure to Water-Insoluble Chromates¹

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INTRODUCTION

This guide is intended to provide guidance in the safe handling of certain chromate compounds that are suspected to be carcinogenic in man (1-8).² Precautions contained herein are believed to protect against possible carcinogenicity, and will also be sufficient to obviate any acute health hazards except where skin hypersensitivity is a factor. Other hazards are considered and discussed.

The time-weighted average (TWA) permissible exposure limit (PEL) specified in this guide are based on studies evaluated by the American Conference of Government Industrial Hygienists (ACGIH) (9). Epidemiological studies of the chromate producing industry have indicated that observed adverse health effects were associated with environmental levels and hygiene procedures considerably less exacting than those recommended here (see Appendix X1).

Hygiene controls and medical surveillance measures have been chosen to protect workers, recognizing that the potential for exposure will vary widely from industry to industry and between one location and another, depending on the compounds handled, scale of operations, kind of process, and physical conditions.

The key to maintaining chromate levels below the PEL is through implementation of cost effective engineering controls augmented as necessary by personal protective equipment, or work practice controls, or both. The choice of methods should depend upon the factors involved in each specific situation.

Biological monitoring is also recommended for lead chromate (see 7.4).

All applicable federal, state, county and local regulations must be complied with when this guide is used.

1. Scope

1.1 This guide covers control procedures for the safe production, storage, transportation, and handling of only the hexavalent chromium compounds found in Table 1 and their various hydrates, and mixtures of coprecipitates of the same regardless of crystalline form.

1.2 This guide is not intended to cover (a) such “soluble” chromates as chromates of sodium, potassium, magnesium, or ammonium; (b) soluble bichromates; (c) chromic acid; (d)

volatile chromyl compounds; (e) any trivalent chromium compound; or (f) elemental chromium. Omission of said compounds or classes of compounds should not be construed to mean that they may be handled without due regard to their particular physical, chemical, and toxicological hazards (9, 10, 11).

1.3 The chromate ion, CrO_4^{-2} , depending upon the acidity, complexes to form di-, tri-, and higher polychromates; hence, the chromates listed in Table 1 may contain mixtures of polychromates, depending on the method of isolation and end use.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. (For more specific precautionary information see Section 5.)*

¹ This guide is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.21 on Chemical Analysis of Paints and Paint Materials.

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² The boldface numbers in parentheses refer to the references at the end of this guide.