

Miller, Diane M. (CDC/NIOSH/EID)

From: Aaron Tripler [ATRIPPLER@aiha.org]
Sent: Thursday, February 26, 2009 9:17 AM
To: NIOSH Docket Office (CDC)
Subject: 144 - NIOSH Criteria Document Update: Occupational Exposure to Hexavalent Chromium
Attachments: NIOSH-Hex Chrom Comments-02-26-09.doc

On behalf of the American Industrial Hygiene Association, please accept the attached comments on the Draft Criteria Document Update: Occupational Exposure to Hexavalent Chromium.

Should you difficulty opening the document or have additional questions please contact me.

Thank you for your consideration.

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Aaron K. Tripler
Director, Government Affairs

Direct +1 703-846-0730 | Office +1 703-849-8888 | Fax +1 703-207-8673 | www.aiha.org
2700 Prosperity Ave., Suite 250, Fairfax, VA 22031

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February 26, 2009

NIOSH Docket Office
Robert A. Taft Laboratory
4676 Columbia Parkway, MS C-34
Cincinnati, OH 45226

RE: NIOSH Docket 144

Docket Officer:

The American Industrial Hygiene Association (AIHA) expresses its appreciation to the National Institute for Occupational Safety and Health (NIOSH) for the opportunity to comment on the draft document "NIOSH Criteria Document Update: Occupational Exposure to Hexavalent Chromium". Announcement of the draft document was issued by NIOSH in September 2008.

As the premier association of occupational and environmental health and safety professionals, AIHA members serve on the front line of worker health and safety. AIHA members, as well as employees and employers, rely on federal and state rules and regulations to improve the health and safety of the workplace and believe the issue of the hazards resulting from exposure to confined spaces in the construction industry is of the utmost importance. We applaud the agency for taking this step in proposing this rule.

Prior to providing the Agency with AIHA's specific comments, we would like to provide you with the process by which AIHA compiled these comments and recommendations. Two of AIHA's technical committees, the AIHA Construction Committee and the AIHA Occupational Medicine Committee each reviewed the document and submitted comments for submission. Most of the comments were compiled by the Construction Committee, whose members are actively engaged in exposure assessment research, regulatory compliance, management, and oversight of hexavalent chromium issues. In addition, the AIHA Construction Committee sponsored and arranged Hexavalent Chromium Roundtables at the AIHA Conference in 2005 and 2006 and a Welding Roundtable in June of this year.

Brief comments were also compiled by the AIHA Occupational Medicine Committee.

AIHA appreciates the opportunity to work with NIOSH to help achieve the mutual goal of protecting American workers from the hazards resulting from occupational exposure to hexavalent chromium. We look forward to further opportunities to work with the agency on this and similar issues and regulatory priorities.

If AIHA can be of any further assistance, please contact me. Thank you.

Sincerely,

Lindsay E. Booher, CIH, CSP
AIHA President

AIHA Review and Comment:
NIOSH Criteria Document Update:
Occupational Exposure to Hexavalent Chromium

NIOSH Docket 144

Charge to Peer Reviewers

The peer review charge was developed in accordance with Office of Management and Budget (OMB) guidelines, is consistent with NIOSH peer review practice, and is intended to ensure that credible and appropriate science is used in the development of criteria documents and recommended exposure limits. The peer reviewers have been asked to consider the following questions:

- Are the critical studies presented clearly and adequately?
- Do all of the presented studies use scientifically valid methods and techniques?
- Are there additional critical studies relevant to occupational exposure to hexavalent chromium compounds that should be included?
- Does NIOSH have a transparent and sound basis for its revised Recommended Exposure Limit for hexavalent chromium compounds?
- Is the new NIOSH policy of providing general exposure assessment recommendations instead of a specific Action Level scientifically justified?
- Are the NIOSH recommendations for worker protection clear and justified?
- Are there additional recommendations for worker protection that should be included?

AIHA Construction Committee Comments

- The critical studies were presented clearly and adequately.
- The presented studies used scientifically valid methods and techniques.
- There are additional critical studies relevant to occupational exposure to hexavalent chromium compounds that should be included.

OSHA cites and discusses, in its preamble to the Final Rule for Controlling Cr(VI) Exposure, more research studies related to health effects from stainless steel welding than the welding studies cited in the NIOSH document.

Although the exposure information provided was helpful for some processes, for other processes, the usefulness of exposure information provided was dampened or even rendered unusable due to limitations or lack of specific information. An example of the latter is welding. The exposure monitoring data cited in the NIOSH document does not adequately characterize potential Cr(VI) exposures from common welding operations. There is a lack of usable data and information contained in the document that is specific to Cr(VI) exposure from welding and thermal cutting, especially apparent since more than half of

occupational Cr(VI) exposures occur from welding. There is little exposure sampling data cited pertaining to stainless steel welding. The highest TWA cited was 22 ug/m³, although exposures are known to be much higher. This is no fault of the study cited, however other studies with larger sample sizes have detected higher exposures. Although most welding in industry does not involve a welder using multiple processes with different exposure levels the same day, much of the data collected and provided has this characteristic. The mingling of processes, e.g., TIG, GMAW, PAC, makes it impossible to make any generalizations. We recommend that NIOSH provides more comprehensive exposure monitoring data for Cr(VI) welding that would give a better indication of actual potential exposures from various welding operations. It would be beneficial for NIOSH to provide some broad exposure ranges in terms of air concentrations by welding process and by consumable chromium composition, or at least a discussion of exposure magnitudes by process, and how the consumable composition for various steel categories (e.g., low chromium allow, medium alloy, and high alloy including stainless, inconel, hardfacing), is a major exposure variable, comprising at least 95% of the fume source. Lack of information on chromium content, when there is a broad range of chromium in steels makes it difficult to make generalizations. We recommend NIOSH describe chromium content for the most common chromium steel consumables.

Although very limited in sample size, the information provides a snapshot of exposures in the other industries surveyed, specific details such as percent chromium in the paint, a major exposure variable, for the abrasive blasting, abrasive paint removal, and spray painting were not provided, rather instead a range of 1-30%, making it difficult to make generalizations. No exposure information was provided regarding power plant coal fly ash or refuse derived fuel ash, or castable boiler refractories. Fly ash exposures from air pollution control device maintenance and cleaning will regularly exceed the REL and for coal fly ash will vary by coal rank. Castable refractory exposures will be around the REL.

There are additional recent sources of occupational hexavalent chromium exposure information. Some are published (Journal of Occupational and Environmental Hygiene, The Annals of Occupational Hygiene, Journal of Environmental Monitoring, American Petroleum Institute, EPRI Journal, etc.). Some are presently unpublished, but have been presented at recent conferences (AIHCE), as both podium presentations (PO 108: hexavalent chromium, fly ash (AIHCE 2006) and contained in the hexavalent chromium (2006, 2007) and welding roundtables (2008), and utility roundtable (fly ash, welding 2007). Some of these studies are ongoing and have not yet been submitted for publication, or are about to be submitted, however exposure summary updates have been presented that included large sample sizes for various processes including exposure ranges, geometric means, arithmetic means, and other summary measures. Some of these studies and presentations can be readily identified by internet searches. Upon request, the corresponding authors of this document review will assist NIOSH with providing exposure summary information by process presented during these above mentioned roundtables or platform presentations.

In addition, it has been recognized for years and specified by OSHA and the American Welding Society that welding exposure sampling should be conducted inside the welding hood to more accurately represent exposure. It would be helpful to include this in the document as even today this is not well understood yet in industry. Standardization of data collection methods would be useful for future epidemiology studies.

In 3.2, NIOSH discusses some wipe sampling methods. However, to our knowledge there are no current consensus criteria to assist in the interpretation of wipe sampling data. We suggest that NIOSH either summarize such criteria/guidelines (if it exists) for interpreting wipe sampling data or make a statement that there is no existing consensus criteria or guidelines for interpreting wipe sampling data. Note: (See AIHCE Welding Roundtable 2008 for surface sample wipe versus micro-vacuum sample comparisons).

In 8.5 and 3.2, it would be beneficial for NIOSH to include a discussion of the possibility of Cr(VI) reduction that may occur to the samples and to stress the importance of prompt lab analysis following field sampling.

(4) NIOSH has a transparent and sound basis for its revised Recommended Exposure Limit for hexavalent chromium compounds.

- (5) The new NIOSH policy of providing general exposure assessment recommendations instead of a specific Action Level is scientifically justified.
- (6) The NIOSH recommendations for worker protection are clear and justified.
- (7) There are additional recommendations for worker protection that should be included.

It is expected that it will be very difficult to maintain exposures for welders below the proposed REL of 0.2 ug/m³ in many stainless steel welding operations (or allied processes), even with local exhaust ventilation and respiratory protection.

Other than local exhaust ventilation, there was a lack of information provided on engineering controls for exposure reduction. Not mentioned is fume extraction built into the welding nozzle of MIG machines used for FCAW and GMAW. There has been a significant amount of work published and presented at the aforementioned conferences regarding exposure levels by welding process and process selection for exposure reduction. For example, the high to low rank order of hexavalent chromium exposure levels by stainless or other chromium steel welding process is flame spraying, shielded metal arc welding, flux cored arc welding, gas metal arc welding, and last, gas tungsten arc welding and submerged arc welding. Decreasing the oxygen potential of shielding gases for flux cored arc welding and gas metal arc welding, and for gas metal arc welding, operating in pulsed mode reportedly also reduce exposure levels. Mechanical cutting in place of thermal cutting, will eliminate exposures. Recently reported, is the development of lower hexavalent chromium fume emission electrodes.

For chromate paint abrasive paint removal, methods such as power tools such as needle scalers and grinders with shrouded heads and HEPA vacuum attachments were specified in the OSHA Lead Construction Standard. Also available for paint removal are vacuum blasters.

With regard to spray painting chromate paints, high zinc substitutes are in use.

Work practices to keep dust levels lower in power plant coal fly ash cleaning will reduce exposure levels.

NIOSH's assigned protection factor for a full face powered air-purifying respirator (PAPR) of 50, equivalent to a negative pressure full face respirator, seems inadequately low considering ANSI and OSHA have assigned a protection factor of 1000 for a full face PAPR.

Additional Comments on the Document

NIOSH refers to OSHA as having a Cr(VI) standard that covers general industry, maritime, and construction. But OSHA actually has separate Cr(VI) standards for each of these industries.

In Chapter 2, a discussion would be helpful on how Cr(VI) is generated from welding so it is clear to the readers that welders do not normally work with Cr(VI) compounds but instead Cr(VI) is generated when heating chromium-containing steels above its melting temperature.

In Chapter 8, NIOSH states that gloves and chemical protective clothing (CPC) with maximum body coverage should be provided for all employees exposed to Cr(VI) compounds. We recommend NIOSH be more specific (e.g., when workers are exposed to Cr(VI) above the REL), or when there is a skin or eye hazard (as OSHA addresses protective clothing). "Skin and eye hazards are considered to be minute in typical welding operations (per OSHA). We are not aware of a prevalence of episodes of skin or eye effects due to Cr(VI) exposure from welding operations. NIOSH should address their recommendation for gloves and CPC specific to welding operations." We recommend NIOSH address their recommendation for gloves and CPC specific to welding operations.

In 8.6, NIOSH states that a medical monitoring program for all workers with occupational exposure to Cr(VI) compounds should be established. We recommend NIOSH be more specific (e.g., when workers are exposed to Cr(VI) above the REL).

In 8.6, NIOSH provided specific recommendations in regards to the medical surveillance program for Cr(VI). In 3.3, NIOSH discusses different biological markers that may be considered for the purpose of

evaluating Cr(VI) exposure. We agree that such biological markers (e.g., Cr in urine, Cr in blood, plasma, and blood cells, etc.) should not be performed as a routine test in the medical surveillance exams. But NIOSH does not explain why such biomarkers are not listed in the recommended medical exam protocol. To further clarify this point, we suggest that NIOSH add a brief statement in 8.6 to this effect (i.e., there is no medical justification for routine blood or urine analysis for the detection of Cr(VI)-related health effects).

In 8.7 and 8.3.2, NIOSH states that smoking shall be prohibited in areas where workers are exposed to Cr(VI) compounds. We recommend NIOSH be more specific (e.g., when workers are exposed to Cr(VI) above the REL).

AIHA Occupational Medicine Committee Comments

- Just a minor comment on 2.5.1 Blade et al. 2007. The document can state that the number of samples collected for some operations was too small (i.e. Only 1 or 2) and is a limitation of the study.
- All presented studies use scientifically valid methods and techniques.
- We were not aware of relevant studies not included in this document
- It seems as though NIOSH has a transparent and sound basis for its revised REL for Cr(VI) compounds.
- NIOSH recommendations for worker protection seem clear and justified.
- Another minor comment in 8.6.2.1 Worker Education - last two sentences. They should be instructed to inform their supervisor or the medical director of any symptoms consistent with Cr(VI) procedure. They should be instructed to report any accidental exposures to Cr(VI) or incidents involving potentially high exposure levels. Workers should report these to the Medical director, as well as the accidents to their supervisor. They should also inform their personal physician (and any other type of physician they visit) regarding exposures at work and any symptoms they believe are attributed to work. Due to the privacy of personal medical information, the worker should not be expected to inform his/her supervisor of any symptoms consistent with Cr(VI) procedure, unless work-relatedness of symptoms is confirmed by a physician.