

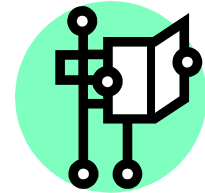


SPRING 2009

## CANADIAN COUNCIL OF OCCUPATIONAL HYGIENE NEWSLETTER (CCOH)

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## Editor's Message

Hello and Welcome to Our 2009 Spring Newsletter. As you can see the newsletter has a new look, I suppose that is to be expected with a new editor. My name is Michelle Kutz and I have agreed to take on the task of compiling a regular newsletter for CCOH. Hopefully you will all answer my call in the upcoming months to share some of your local section news and perhaps write a thought provoking article for the newsletter.

I think this newsletter is an excellent venue for all of us to showcase and learn about the many facets of the Occupational Hygiene profession in each province and territory. We would like all of you to take the time to share your expertise and experience, submit your articles to me at [mkutz@golder.com](mailto:mkutz@golder.com).

I would like to thank our President Lorraine Shaw for responding to my request. In this issue, Lorraine, from the Occupational and Environmental Health Laboratory at McMaster University, tackles the puzzling issue of how best to assess diesel exhaust exposure in the workplace.

In my search to uncover timely articles I came across an article titled "Canada's Embarrassment" from the OH Forum's Winter 2009 edition (Occupational Hygiene Association of Ontario Newsletter) written by their President Jason Hoffman. Have a read, and see if it doesn't get you wondering what our government is thinking when it defends its policy on asbestos export.

CCOH would like to have a voice from all our Canadian associations, and we just about do. We are still in need of a Director from Quebec and the Northwest Territories/Nunavut. Tell your friends and colleagues!

Michelle Kutz, CIH



Join the National Office of the Workplace Hazardous Materials Information System (WHMIS) e-mail list to receive the latest news and information relating to WHMIS. Membership is open to the public. Subscribers receive an update when new information regarding WHMIS, such as, implementation of the Globally Harmonized System (GHS), is posted on the Health Canada Web site ([whmis.gc.ca](http://whmis.gc.ca)). To Subscribe, send an email to: [whmisn-nsimdut-subscribe@list.hc-sc.gc.ca](mailto:whmisn-nsimdut-subscribe@list.hc-sc.gc.ca)

## Diesel Exhaust by Lorraine Shaw, B.Sc., CIH, ROH

Ever since the ACGIH withdrew its' TLV for diesel exhaust in 2001, Industrial Hygienist have been wondering what to do with diesel exhaust – what contaminants to measure and what occupational exposure limits to compare values against.

### Components of Diesel Exhaust

Diesel exhaust is composed of a complex mixture of thousands of compounds, including gaseous and particulate components.

Gaseous compounds which make up diesel exhaust include carbon monoxide, carbon dioxide, oxides of nitrogen, oxides of sulfur, formaldehyde and other aldehydes, hydrocarbons and polynuclear aromatic hydrocarbons (PAHs).

The particulate fraction of diesel exhaust is composed of solid carbon particles (elemental carbon), 95% of which are less than 1 µm in diameter. As many as 1800 different compounds can be absorbed onto the diesel exhaust particulate.

Just to make matters even more confusing, the composition of diesel exhaust varies with the type of fuel used, the type of engine and load on the engine, load cycle, engine tuning and maintenance and treatment of the exhaust gas.

### Measurement of Diesel Exhaust

Historically, measurements have been made of the gaseous components of diesel exhaust, including carbon monoxide, carbon dioxide, oxides of nitrogen and sulfur. Strong correlations between the various components have not been found in studies of diesel exhaust exposures. Fowler (1985) evaluated various analytes as indices of overall diesel exposure, including CO, CO<sub>2</sub>, SO<sub>2</sub>, NO, NO<sub>2</sub>, total and fine particulate, organic carbon and elemental carbon. Elemental carbon was found to be the most reliable measure of diesel exhaust as an entity, ie. It reflected exposures to the largest number of exhaust components examined.

Birch and Cary (1996) reviewed the methods that had been used to measure occupational exposure to diesel particulate. They concluded that the methods used in the past were not sensitive or selective enough and proposed a new approach, using elemental carbon as the marker for diesel exhaust exposure. They based their proposal on the fact that diesel exhaust, while composed of many compounds, contains approximately 88% organic and elemental carbon. Organic carbon comes from a variety of sources, but there are very few sources of elemental carbon. Their studies showed that elemental carbon was approximately 50% of the total carbon in the diesel exhaust.

The method for analysis of elemental carbon is NIOSH method 5040, measurement of elemental carbon using the thermal optical analyzer. The method is very sensitive, with a Limit of Detection of 0.3 µg/filter portion analysed. While diesel exhaust is submicron in size by its very nature, the method uses a cyclone to cut out larger particulate that may be collected with the diesel exhaust.

### Occupational Exposure Limits

In 1995, the American Conference of Governmental Industrial Hygienists (ACGIH) proposed a TLV-TWA of 0.15 mg/m<sup>3</sup> (particles less than 1 micron in size) and designated diesel exhaust as category A2, Suspect Human Carcinogen. This proposed limit was lowered to 0.05 mg/m<sup>3</sup> (particles less than 1 micron in size), A2 in 1999. In 2001 this proposed limit was lowered to 0.02 mg/m<sup>3</sup>, or 20 µg/m<sup>3</sup> measured as elemental carbon, A2. At this time, the TLV was withdrawn due to limited scientific data to support the TLV.

The Canadian provinces have no OEL for diesel exhaust per se, except in mining, where higher exposure levels are permitted.



## Diesel Exhaust (cont'd)



### UPCOMING EVENTS

Since the ACGIH withdrew the diesel exhaust TLV, Industrial Hygienists have been in a quandary as to what to use as an OEL. The United Kingdom uses a CO<sub>2</sub> limit of less than 1,000 ppm as the surrogate OEL for diesel exhaust exposure (HSE 1999). Germany uses a limit of 100 µg/m<sup>3</sup> elemental carbon (EC), except where organic carbon, OC>EC, when a limit of 150 µg/m<sup>3</sup> total carbon (TC) applies. These levels compare with those used in the Canadian and US mining industries (for example, MSHA in the US 160 µg/m<sup>3</sup> EC, NB 1.5 mg/m<sup>3</sup> measured as respirable combustible dust (RCD)). The proposed ACGIH TLV of 20 µg/m<sup>3</sup> can still be used as a best practice guideline for workplaces other than mines.

Seshagiri and Burton (2003), of Human Resources Development Canada studied 23 work sites in five categories, (bus repair garages, truck repair garages, locomotive workshops, tunnels and other exposures), taking a total of 177 full shift air samples. About 77% of the samples had EC concentrations below 20 µg/m<sup>3</sup>, 54% less than 10 µg/m<sup>3</sup> and 91% less than 50 µg/m<sup>3</sup>. This data shows that most workplaces of these types should be able to meet the proposed TLV with adequate mechanical ventilation.

#### References:

American Conference of Governmental Industrial Hygienists (2001): Documentation of the Threshold Limit Values and Biological Exposure Indices, Diesel Exhaust (Particulate and Particulate Adsorbed Components) Draft Documentation.

Birch, M.E. and Cary, R.E. (1996). 'Elemental Carbon-Based Method for Monitoring Occupational Exposures to Particulate Diesel Exhaust', Aerosol Science and Technology 25:221-241.

HSE (1999) Control of diesel engine exhaust emissions in the workplace, HSC 187, Sudbury: HSE Books.

Seshagiri, B. and Burton, S. (2003) 'Occupational Exposure to Diesel Exhaust in the Canadian Federal Jurisdiction', AIHA Journal 64,3:338-345.

Wheatley, A.D. and Sathra, SI (2004) 'Occupational Exposure to Diesel Exhaust Fumes, Ann. Occup. Hyg. 48,4:369-376.

**April 28- National Day OF Mourning** -a day set aside to commemorate workers who have been injured or lost their lives in the workplace.

**May 3-9 -North American Occupational Safety and Health (NAOSH) Week** - Make it Home Safe Every Day!  
<http://www.naosh.org>

**May 30 - June 4 AIHce 2009, Toronto, ON AIHce'09 Conference & Expo** Toronto, Ontario, Canada  
<http://www.aiha.org>

**October 1 – 6 PCIH Best Practices. Best Performance. Best Standards - Vancouver, BC** Conference information:  
<http://www.aiha.org/pcih09/default.htm>

**October 7 -8 Northwest Occupational Health Conference- Vancouver, BC**, information: [administrator@pnsaiha.org](mailto:administrator@pnsaiha.org)

**October 26 - 28 Alberta Health and Safety Conference and Trade Fair -Calgary, Alberta** <http://www.hsconference.com>

### Health Canada Advises Canadians Not to Use Electronic Cigarettes

Health Canada is advising Canadians not to purchase or use electronic smoking products. Most of these products are shaped and look like cigarettes or cigars. They produce a vapour that resembles smoke and a glow that resembles the tip of a cigarette. They consist of a battery-powered delivery system that vapourizes and delivers a liquid chemical mixture that may be composed of various amounts of nicotine, propylene glycol, and other chemicals. Nicotine is a highly addictive and toxic substance, and the inhalation of propylene glycol is a known irritant.





## Canada's Embarrassment by Jason Hoffman, CIH

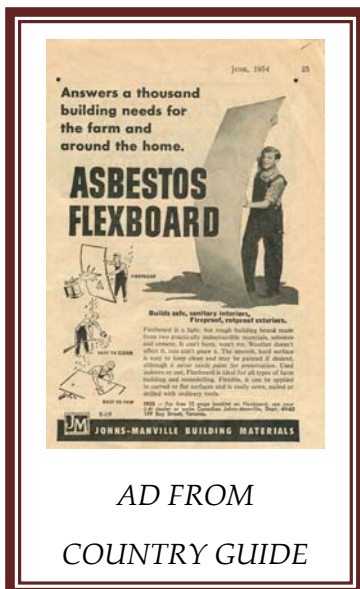
(OH FORUM 1-Winter 09)

Despite working in the field of occupational hygiene, until fairly recently I didn't put much thought into why Canada continues to export asbestos (approximately 180,000 tons/year) to developing countries even though we put so much effort into managing the hazard from its prevalent use decades ago and preventing more from entering our workplaces (on Canadian soil). However, I do vaguely remember wondering if Jean Chrétien had any first hand knowledge about how our exports were really used, and what protective steps were actually followed to prevent exposure in the countries receiving the product that he (and the Quebec Federation of Labour) insisted could be used safely. I'm sure that in some workplaces in developing areas it is used safely but I suspect that is not the norm based on the feedback I've seen from the regions we typically sell to.

A couple of years ago, I was talking to a Professor of Occupational and Environmental Hygiene from Australia and he expressed confusion over Canada's highly regarded international reputation and its lack of rational action on the international asbestos trade issue. I began to understand how "out there" we were with respect to the majority of the developed world. Australia had banned mining and use of asbestos in

2003. Other countries to jump on board recently in banning production (and/or use) were Chile in 2001 and South Africa in 2005. It did seem that Canada had turned the corner and was going to get a full understanding of the health issues surrounding chrysotile (the form still exported by Canada) when they called a meeting of the international experts on asbestos in early 2008 that was chaired by Trevor Ogden, Editor of the Annals of Occupational Hygiene, who wrote an interesting editorial of this experience in the Sept. '08 issue. Supposedly, the report was going to be published by Health Canada in July '08, but to my knowledge, nothing has surfaced yet.

The much anticipated (by many at least) Canadian asbestos "consensus" report certainly didn't go public before the international trade meeting was held in late October in Italy to review which materials should have restrictions added to them for trade due to hazardous properties (named the Rotterdam Convention, a treaty under the United Nations first agreed upon in 1998). Canada was not as vocal in discouraging the addition of chrysotile to the Rotterdam Convention as in previous meetings (2006 most recently), but their most important customers, Vietnam, Pakistan and India definitely were. It was again kept off the list...



AD FROM

COUNTRY GUIDE



# Canada's Embarrassment, (cont'd)



The year 2008 saw both extremes of "Health Science" in Canada. Bisphenol A, a polymer additive with endocrine disrupting properties was added to a list of toxic substances under the federal Chemical Management Plan, mandating restrictions for high risk usage of the material - a bold move, since Canada is the first country to take this step. In the same year (a year with a Federal election and an international Rotterdam Convention meeting) an expert health risk report seemingly "disappears". I have to wonder if the bisphenol A Health Risk Assessment would have seen the light of day if there had been a strong political opposition to its content. Canada's involvement in international asbestos trade is definitely not the first example of conflict between science and politics and it won't be the last. I guess I just had a little more faith given Canada's historical reputation for doing the right thing.

Jan.14,2009 CANADIAN ZONOLITE ATTIC INSULATION CLAIMS, (Canada NewsWire via COMTEX) — A settlement has been reached and a Fund has been established to pay valid Zonolite Attic Insulation (ZAI) claims relating to property in Canada ("CDN ZAI PD Claims") against W.R. Grace & Co. and other related entities.

CDN ZAI PD Claims are property related claims that could include the cost of abatement or removal, the diminution of property value, economic loss, or other property-related claims.  
 Claims must be filed by **AUGUST 31, 2009**

ZAI is a loose-fill, non-roll vermiculite home attic insulation that may contain naturally occurring asbestos. It was sold from the 1920/1930s to 1984. For complete information call 1-877-465-4817 or visit [www.graceclaims.com](http://www.graceclaims.com).

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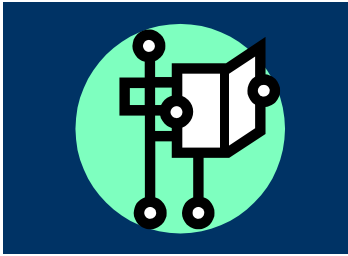
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## FREE Online Viewing of CSA Standards

**View Access** is a funded pilot project established by the Canadian Standards Association (CSA) in collaboration with all Canadian government departments responsible for occupational health and safety (OHS).

The intent of the free service is to help employees and employers to quickly and easily find regulation requirements which will ultimately promote compliance with the standards. Go to the following link for free CSA Standard viewing:

<http://ohsviewaccess.csa.ca/>

Anyone interested can view CSA standards in federal, provincial and territorial Occupational Health and Safety regulations.

CCOH is a not-for-profit organization that has been established to provide a formal, coordinated, perspective on Occupational Hygiene amongst Canadian Occupational Hygiene Associations

### **FREE WEBINARS from the CANADIAN CENTRE FOR OCCUPATIONAL HEALTH AND SAFETY (CCOHS) <http://www.ccohs.ca/>**

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## Eat Broccoli Sprouts To Reduce Stomach Cancer Causing Bacteria

(Dr. Steven Chang, [RightHealth DailyDose](#), April 08, 2009)

A study led by Johns Hopkins University researchers has found that eating broccoli sprouts can reduce the activity of *H. pylori*, a bacteria that often infects human stomachs and can lead to inflammation, ulcers, and even stomach cancer. Broccoli sprouts contain sulforaphane, a compound that has been found to act like an antibiotic. By reducing the activity of the bacteria, the inflammatory environment that can lead to cancerous growth may probably be reduced as well.

**"The time to relax is when you don't have time for it."**

***Author Unknown***