

FIRE FIGHTERS GUIDANCE NOTE # 6- 36

ISSUE: **LIMITING EXPOSURE TO FIRE GASES**

Consistent with the general duty clause 25(2) (h) of the Occupational Health and Safety Act (OHSA), employers are required to take every precaution reasonable in the circumstances to protect workers. Clause 25(2) (a) of the OHSA requires employers to provide information, instruction, and supervision to protect the health and safety of workers, and clause 25(2) (d) requires employers to acquaint a worker or a person in authority over a worker with any hazard in the work.

Today's fires have the potential to give off a myriad of fire gases such as Hydrogen Cyanide (HCN).

HCN is a deadly gas given off as a by-product of combustion. The greatest amounts of HCN are released during the smouldering stages of fire. HCN has an IDLH¹ of 50 ppm. Regulation 833, Control of Exposure to Biological or Chemical Agents, made under the OHSA, adopts a STEL² of 4.7 ppm (skin) for HCN.

Examples of fires that may produce elevated levels of HCN can include pot on a stove/cooking fires (an average small kitchen fire may produce 75 ppm of HCN), car fires, dumpster fires, overhaul operations or fire investigations.

Symptoms of HCN exposure could range from a headache or blurred vision to seizures or death. Long-term health effects could include respiratory problems, heart disease or brain damage.

To reduce firefighter exposure, fire departments should develop a program in consultation with the Joint Health and Safety Committee/ Health and Safety Representative that consists of at least the following elements:

- Awareness training – on topics such as the properties of fire gases, recognizing potential exposure hazards, signs and symptoms of exposure etc.
- Air monitoring – to detect fire gas levels
- Protocols - for respiratory protection, scene decontamination, personal protective equipment (PPE), transportation of contaminated PPE and personal decontamination etc.
- Reporting and documentation of air sampling and exposure

- Operating policies/guidelines

Fire department should also coordinate with local health authorities to ensure there are treatment protocols/antidote for fire gas exposures. As an example, for HCN the antidote is cyanocobalamin.

Although this guidance note provides information limited to HCN, employers must take every precaution reasonable in the circumstance to protect workers from all fire gases.

References:

GN #4-8 - Care, Maintenance, Inspection and Replacement of Structural Firefighting Personal Protective Equipment

GN #4-9 - Respiratory Protection Program

Regulation 833 - Control of Exposure to Biological or Chemical Agents, made under the OHSAA.

1. **IDLH** is an acronym for Immediately Dangerous to Life or Health, and is defined by the US National Institute for Occupational Safety and Health (NIOSH) as the threat of exposure to airborne contaminants where exposure is "likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment." Examples include smoke or other poisonous gases at sufficiently high concentrations.
2. A **STEL** is a Short Term Exposure Limit. It is defined in Regulation 833 Control of Exposure to Biological or Chemical Agents as "the maximum airborne concentration of a biological or chemical agent that a worker may be exposed in any 15-minute period." For HCN, the regulation adopts the STEL stipulated in the 2013 Association Advancing Occupational and Environmental Health (ACGIH) Booklet.
3. Fire Smoke Coalition (Division of the Cyanide Poisoning Treatment Coalition) Hydrogen Cyanide and Carbon Monoxide Combustible Material Fire Smoke and Air Monitoring -Tarrant County College, Fort Worth, TX

This guidance note has been prepared to assist the workplace parties in understanding some of their obligations under the *Occupational Health and Safety Act* (OHSA) and the regulations. It is not intended to replace the OHSA or the regulations and reference should always be made to the official version of the legislation.

It is the responsibility of the workplace parties to ensure compliance with the legislation. This advisory does not constitute legal advice. If you require assistance with respect to the interpretation of the legislation and its potential application in specific circumstances, please contact your legal counsel.

While this guidance note will also be available to Ministry of Labour inspectors, they will apply and enforce the OHSA and its regulations based on the facts as they may find them in the workplace. This guidance note does not affect their enforcement discretion in any way.