Do You Use the Solvent 1-Bromopropane in Your Workplace?

According to a recent NIOSH hazard alert, 1-Bromopropane (1-BP), also known as n-propyl bromide (nPB), is an organic solvent that's a potential OHS hazard. It may be a component of some aerosol spray products and is used in numerous commercial and industrial settings, including:

- Vapour and immersion degreasing operations for cleaning metal, plastics, electronic and optical components;
- Adhesive spray applications; and
- Dry cleaning operations.

Workers can be exposed to 1-BP in occupational settings either through inhalation of 1-BP vapors and mists or skin contact with the substance.

Excessive exposure to 1-BP can cause irritation of the eyes, mucous membranes, upper airways and skin, and damage the nervous system. Neurologic effects can present themselves as headaches, dizziness, loss of consciousness, slurred speech, confusion, difficulty walking, muscle twitching and/or loss of feeling in arms and legs.

Example: Six foam cushion gluers who were exposed to 1-BP vapours from spray adhesives complained of slow onset of lower extremity pain or numbness. Five had difficulty walking, leg spasms, loss of sensation in limbs and muscle twitching. Three initially had nausea and headache. Two years after their exposure, the two most severely affected workers still had trouble with walking and loss of feeling in their legs and they, along with a third patient, continued to feel pain most of the time.

The risk of health effects to workers from 1-BP exposure depends on:

- Its concentration in the air they breathe;
- How much comes in contact with their skin; and
- Length of exposure.

The American Conference of Governmental Industrial Hygienists (ACGIH) recommended a time weighted average (TWA) threshold limit value (TLV) for 1-BP of 10 ppm in 2005, which is the OEL for the substance in many parts of Canada, including BC and ON.

NIOSH recommends that employers implement the following types of controls’listed in order of preference’to control worker exposure to 1-BP:

- Eliminate the hazard or replace 1-BP with a less toxic/hazardous process material. For example, if you use 1-BP in a spray adhesive application, replace it with water-based or acetone-based adhesives. (Note that replacement chemicals may have their own hazards that need to be considered and controlled.)
- Use engineering controls such as isolation and ventilation to reduce worker exposure to 1-BP in the air.
- Implement administrative controls, such as safe work practices and policies, to reduce or prevent exposure to 1-BP.
- Require workers at risk of exposure to the substance to wear appropriate PPE when engineering controls aren’t feasible or when engineering and administrative controls aren’t effective in adequately reducing exposure. In most workplaces using 1-BP, consider PPE that provides both respiratory and skin protection.