

ASTHMA IN THE WORKPLACE

PLUMBING AND HEATING
PREVENTION FACT SHEET
RF-537



GET THE FACTS

AND WORK SMARTER

If you're in the plumbing or heating profession, there are health risks you should know about. Getting the facts will help you work smarter and avoid certain practices that could lead to occupational asthma and rhinitis.

Vapors, fumes and mists from products, for instance, are among the main risk factors that can cause or aggravate these respiratory diseases.

READ THE SAFETY
DATA-SHEETS
FOR THE PRODUCTS
YOU USE.
MAKE SURE YOU
UNDERSTAND
WHAT'S IN THEM.

FIND OUT

ABOUT ASTHMA

Asthma is a chronic respiratory disease that makes breathing—especially exhaling—difficult.

Asthma usually results from allergies to certain substances in your environment. Its main symptoms are coughing, shortness of breath, wheezing and tightness in the chest. Asthma can also be accompanied by symptoms of rhinitis and conjunctivitis.

Asthma in the workplace can be:

- Caused by exposure to allergenic or irritant substances found in the learning or work environment; or
- Aggravated in somebody who is already asthmatic by these irritant substances or physical factors (e.g., extreme ambient temperatures).

In both cases, the symptoms get worse when the person performs training or work-related tasks that carry a risk of exposure. They decrease or disappear outside the learning or work environment.

ABOUT RHINITIS

Rhinitis is a respiratory disease that causes inflammation of the mucous membranes in the nose, stuffy nose, runny nose and eyes, and sneezing.

UNDERSTAND

THE RISK FACTORS

As a plumbing or heating student, you perform very similar tasks to those performed on a construction site. The commercial products and raw materials you use could cause or aggravate asthma.

These products and materials are the main source of fumes, vapors and mists that irritate or sensitize the respiratory tract. You could also be directly exposed to a chemical substance through skin contact.

The types of solder, welding and brazing techniques, and the choice of glues, strippers and cutting oils can lead to a health risk.



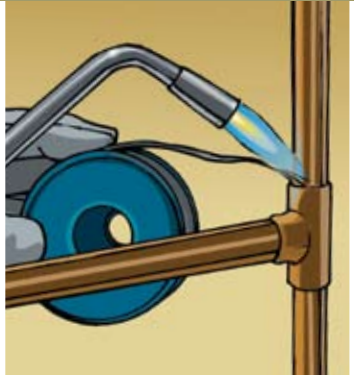
Brazing on copper

Gluing of ABS and PVC pipes

Welding and flame cutting on mild steel

Threading of pipes

IT IS IMPORTANT TO UNDERSTAND WHICH ARE THE HAZARDOUS TASKS AND POTENTIALLY-HARMFUL SUBSTANCES, AND HOW TO CONTROL EXPOSURE.



CHEMICAL HAZARD

Inhalation of irritant or sensitizing fumes and gases	●		●	●
Inhalation of irritant or sensitizing vapors	●	●	●	
Skin contact with irritant or sensitizing substances	●	●		●

EXAMPLE OF PRODUCTS

Brazing wire	●			
Brazing rods	●			
Strippers for brazing	●			
Glue for ABS and PVC pipes		●		
Welding rods and wires			●	
Cutting oils				●

EXAMPLE OF SUBSTANCES

Metal fumes (copper, lead, cadmium)	●			
Metal fumes (manganese, iron)			●	
Zinc chloride	●			
Volatile organic compounds (VOCs) (tetrahydrofuran, methyl ethyl ketone, cyclohexanone, etc.)		●		
Nitrogen oxides			●	
Ozone			●	
Mineral oil				●

MEANS OF CONTROL

Substitution	●	●		
Work method	●	●	●	●
Capture at source			●	●
General ventilation	●	●	●	●
Respiratory protection	●	●	●	●
Skin protection	●	●	●	●

Informing and training students, apprentices and employees on the risks of exposure to substances in their learning or work environment, the sources of emission, the most hazardous tasks, methods of control (including work practices and methods) and personal protective equipment are key to controlling exposure.

PROTECT

YOURSELF RESPONSIBLY

Protecting your respiratory tract

Use a respirator if you cannot control exposure any other way.

The N95 filtering half-facepiece respirator is recommended to protect against dust and fumes. You could also use other respirators depending on the intensity of exposure, the nature of the task and the degree of effort. For example, wearing an R95 model or a respirator with filter cartridges would be appropriate in the presence of oil mists.

All respirators have a protection factor (PF) that indicates how effective they are and that reflects the theoretical concentration of the contaminant in the environment compared to that inside the mask. So, a factor of 10 indicates that the concentration inside the respirator is 10 times less than that in the learning or work environment.

For a respirator to offer appropriate protection against a particular substance, you have to look at the permissible exposure value (PEV) for that substance, as stated in the Regulation on occupational health and safety (ROHS).

The teaching institution must also set up a training program so that apprentices know how to use a respirator, its limitations and maintenance, and arrange for a personal fitting to adjust the respirator in accordance with the regulations in Quebec.¹

A surgical mask is not a respirator



Unlike the N95 filtering half-facepiece respirator, a surgical mask is not designed to filter dust. It is not effective or airtight enough to meet regulations.



Protecting your skin

As you go about your training or professional work in plumbing or heating, irritant or sensitizing substances (such as glues and solvents) may contact your skin. Wearing nitrile gloves will reduce this type of risk. However, they are only appropriate for some mixes. So, it is important to check how effective your choice of protection is with the manufacturer before adopting it.

Choosing a respirator to suit the intensity of dust and vapor you are exposed to*

Stressor	Intensity	Types of respirators*	PF
Dust and fumes	Under 10 times the PEV	N95 filtering half-facepiece Half-facepiece with N95, P95 or P100 filter cartridges	10
	Over 10 times the PEV	Full-facepiece with N95, P95 or P100 filter cartridges Powered air-purifying respirator (PAPR) with HEPA filter cartridges	100
Volatile organic compounds (organic solvents, ABS, PVC glues)	Under 10 times the PEV	Half-facepiece with organic vapor filter cartridges	10
	Over 10 times the PEV	Full-facepiece with organic vapor filter cartridges Powered air-purifying respirator (PAPR) with organic vapor filter cartridges	100
Oil mist	Under 10 times the PEV	Half-facepiece with R95 or P100 filter cartridges Half-facepiece with N95, P95 or P100 filter cartridges	10
	Over 10 times the PEV	Full-facepiece with N95, P95 or P100 filter cartridges Powered air-purifying respirator (PAPR) with HEPA filter cartridges	100

* These recommendations do not apply to all work situations. You must check the respirator's efficiency with the manufacturer or with the person responsible for the respiratory health program.

¹ www.irsst.qc.ca/fr/_publicationirsst_862.html

CONTROL

THE RISK TO YOUR HEALTH

Substitute products

First, consider replacing a potentially harmful product with one that reduces or eliminates the risk. A good example is to replace brazing rods or wires with equivalent products that do not contain cadmium or lead.

Work practices

Good work practices and habits can prevent exposure or help to reduce the duration and intensity of exposure. Some examples are:

- Never use an air jet to clean surfaces;
- Stay away from the source of the contaminant and its trajectory.

Capture at source

This reduces exposure to the sawdust generated by equipment. It protects you and the people near your workstation.

Install fixed exhaust equipment, of the exhaust-arm type, in the shop for welding and oxygen cutting activities. Use mobile filter-type equipment with an exhaust arm on a construction site.

Ventilation

General, natural or mechanical ventilation reduces the ambient level of substances and so reduces direct and secondary exposure to allergenic substances associated with hazardous tasks.

On a construction site, workers are exposed to carbon monoxide (CO) from motorized equipment, lift trucks or propane heating systems. Refer to the CSST brochure "Il y a un danger dans l'air : contrôlez le CO !" (2006).



BE INFORMED—BE CAREFUL

Other health and safety risks related to the plumbing or heating profession*

Category	Risk	Methods of control	Information
Chemical Safety	Confined space	Install appropriate ventilation to limit the accumulation of toxic and flammable compounds and to ensure a sufficient level of oxygen Adopt lockout and entry procedures in a confined space	ASP-Construction
Safety	Use of machines Explosion (transportation of acetylene)	Wait at least one hour before using a horizontally-stored acetylene tank Wear a guard or protective device. Adopt lockout procedure	
Physical	Noise Ultraviolet (UV) and thermal burns	Wear ear-plugs and ear muffs Wear fireproof coveralls, welders' gloves and welders' glasses with UV filter	ASP-Construction CSST
Chemical	Asbestos Lead Dangerous reactions and incompatibilities	Use WHMIS training Consult the product's material safety data sheet Adopt a procedure for working in the presence of asbestos Wear respiratory protection Adopt a procedure for work in the presence of lead. Wear respiratory protection	ASP-Construction CSST
Ergonomics	Back loading	Modify the task or workstation Warm up muscles before work Adapt physical conditioning to the task Adopt a suitable work posture	CSST IRSST
Biological	Bioaerosols (cutting oils)	Replace cutting oil regularly	IRSST / NIOSH

* This list is not exhaustive and does not apply to all workplaces.

TO LEARN MORE

Guide d'utilisation d'une fiche signalétique, CSST

http://www.csst.qc.ca/portail/fr/publications/DC_200_338_5.htm

Asthme CSST

<http://www.asthme.csst.qc.ca/>

IRSST

<http://www.irsst.qc.ca>

REPTOX

<http://www.reptox.csst.qc.ca/>

ASP-Construction

www.inrs.fr/htm/tc87.pdf

Québec Lung Association

<http://www.pq.lung.ca>

Center for Asthma in the Workplace

<http://asthma-workplace.com/en>

REFERENCES

Roberge, B. et al. *Utilisation de sensibilisants ou d'irritants dans un milieu d'enseignement de métiers de la construction*, IRSST, R-523, 2007, 63 pages.

Verma D. K. et al. *Current Chemical Exposure Among Ontario Construction Workers*. Applied Occupational Environmental Hygiene, 2003, 18:1031-1047.

Lara, J. and Vennes, M. *Guide pratique de protection respiratoire*, IRSST, R-319, 2002, 56 pages. http://www.irsst.qc.ca/fr/_publicationirsst_862.html

Bernstein, L.I. et al. *Asthma in the workplace and related conditions*, 3rd edition. Taylor and Francis, 2006, 875 pages.

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