



Washington State Department of
Labor & Industries

Respiratory Protection – Half and Full Face Cartridge Respirators

Training on the use of respirators in the workplace – module 2



Developed by the Division of Occupational Safety & Health (DOSH)
for employee training
June, 2009

Respirator Training – Module 2

Half-face & Full-face Cartridge Respirators



Half-face respirator



Full-face respirator

Powered Air-Purifying Respirators (PAPR)

A PAPR is an air-purifying respirator with a battery powered fan that sucks air through cartridges and blows it into the facepiece.

PAPRs are not positive pressure respirators, but they can provide better protection than other cartridge respirators.



Respirator Training

Why is This Training Required?

Training is required by WISHA for anyone who wears a respirator.

We also are providing this training so you will know how to protect your health.

If you don't know how to use a respirator properly, you can get a false sense of protection.



Respirator Training

Respirator Program Administrator

Our respirator administrator is [name]

This person is responsible for overseeing our respirator program.

This person has training on respirators.

Where We Require Cartridge Respirators

Respirators are required in the following locations or for the following job tasks:

[List here]



Respirator Use

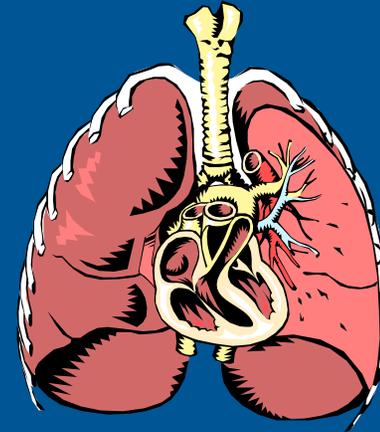
The dust, chemicals or products we provide respirators for are the following:



[List your chemicals or products used here.]

How Do Cartridge Respirators Work?

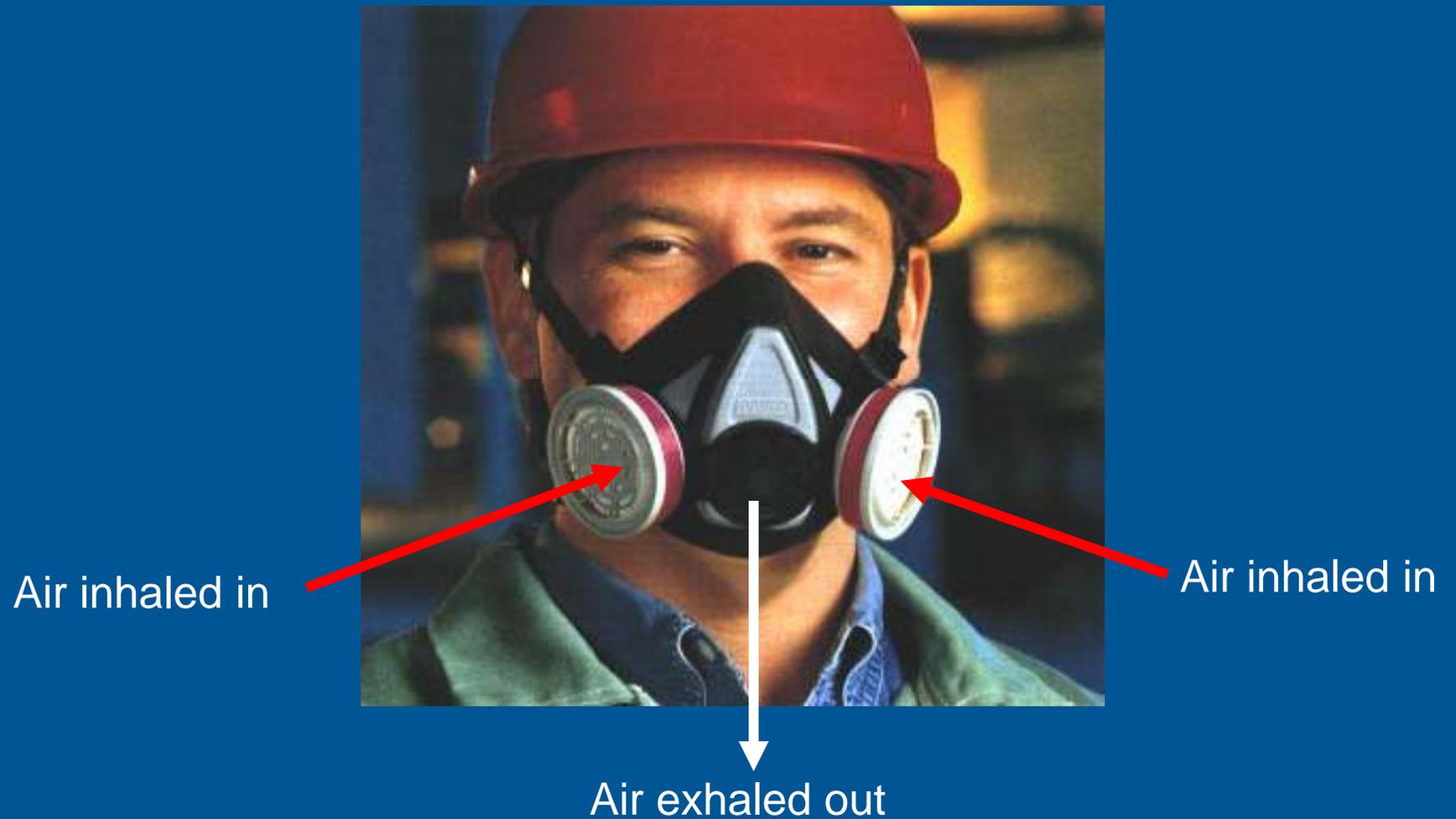
When used properly, respirators prevent the inhalation of chemicals and dust in the air and protect the lungs.



When you inhale, air is pulled through the cartridge, where air contaminants are trapped.



How Cartridge Respirators Work



How Cartridge Respirators Work

Air movement is controlled by rubber inhalation and exhalation valves.

The adjustable straps are used to keep the respirator snug on the face.



Types of Cartridges



Particulate cartridges filter out dusts, mists and fumes only.

Chemical cartridges trap different types of chemicals, but not dust, mists or fumes.

Cartridges are color-coded for the type of chemical or dust.

Types of Particulate Cartridges

Some particulate cartridges are more protective than others

N95/R95/P95 cartridges filter out 95% of dust particles

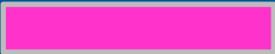
N99/R95/P99 cartridges filter out 99% of dust particles

N100/R100/P100 cartridges filter out 99.7% of dust particles

N99 or **N100** masks are recommended for very fine dust or dangerous dusts such as asbestos or silica.

We use [list type] cartridges

Respirator Cartridge Color Coding

	Dust/fumes/mists - teal
	Dust/fumes - pink (HEPA filter)
	Ammonia- green
	Organic vapor (solvents) - black
	Acid gas (sulfuric acid, for example) - white
	Acid gas and organic vapor - yellow
	Chlorine – white & yellow

These are some commonly used cartridges

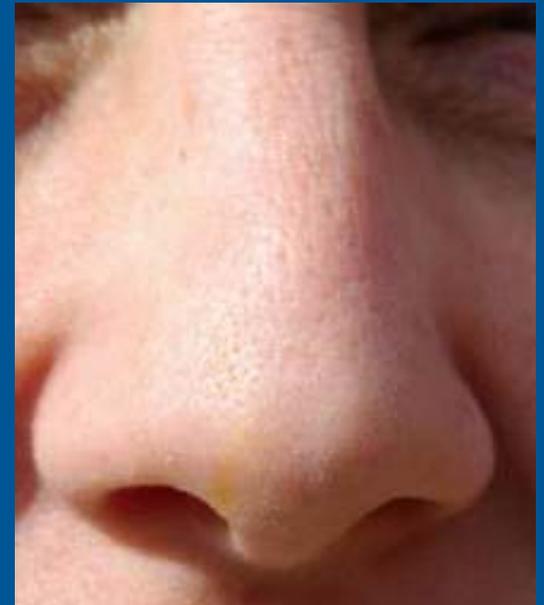
Limits of Chemical Cartridges

Chemical cartridges can absorb only so much chemical.

When their capacity is reached, breakthrough will occur.

You can't always tell if a respirator leaks by a chemical odor.

Some chemicals have no odor, or can only be smelled at high levels.



Changing Cartridges

Cartridges must be changed regularly.

Particulate cartridges are changed when they become difficult to breathe through or are damaged.

Chemical cartridges are changed on a pre-determined schedule.



Half-face Respirator Protection Factor

Half-face cartridge respirators only provide protection to levels **10 times** above the chemical or dust permissible limit.



Example

Ammonia Permissible
Limit – 25 ppm



Respirator Protection
Factor for ammonia –
250 ppm

ppm = parts per million

Full-face Respirator Protection Factor

Full-face respirators can provide protection to levels **50** times above the permissible limit.

Full-face respirators also provide eye protection for irritating chemicals.



PAPR Protection Factor

A powered air purifying respirator can provide protection from 25 to 1000 times above the permissible limit.

The protection factor is unique to the manufacturer of the PAPR and how it is designed.



The protection factor of our PAPRs is [specify]

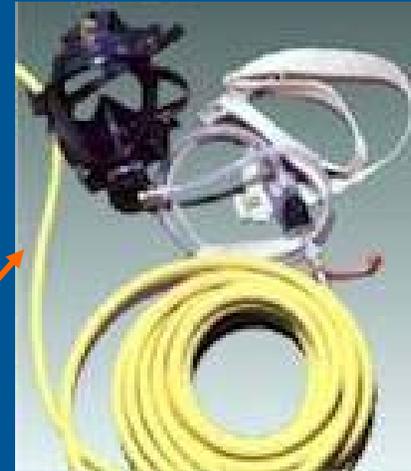
What is a Chemical “IDLH” Level?

“IDLH” means “immediately dangerous to life or health”.

Most chemicals have an IDLH level in the air where cartridge respirators can't be worn.

A cartridge respirator is too prone to leaking to use at levels above IDLH.

The only alternative is a respirator that supplies clean breathing air.



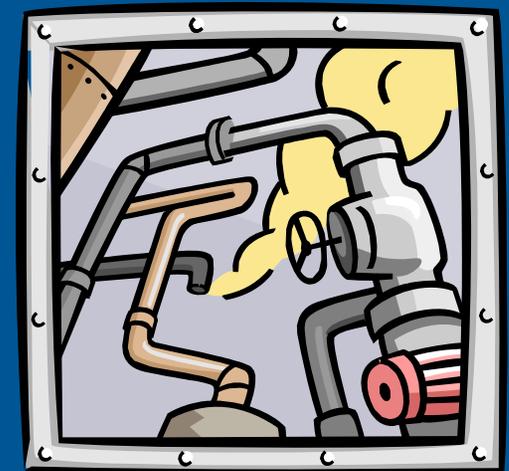
Where Cartridge Respirators Don't Work



Cartridge respirators are not good for large chemical spills or leaks, or thick dust clouds.

Don't use them in emergency situations including fires – they won't provide enough protection.

In the event of a major leak or spill, leave the area.



Where Cartridge Respirators Don't Work

Cartridge respirators don't work where there is a lack of oxygen.

Cartridge respirators cannot protect against high levels of toxic chemicals.

Confined spaces like tanks or manholes can have an oxygen deficiency or high levels of toxic chemicals.



When it Smells Bad or You Feel Sick

Sometimes respirators don't work even when levels of airborne chemicals are low.

If you notice an odor or feel ill, or you think your respirator leaks, notify your supervisor.

Leave the area when necessary.



Respirators and Physical Fitness

Medical Evaluations

Medical evaluations are required for anyone wearing respirators.

Breathing through a respirator is work for the body.

Respirators can be hazardous to people with heart or lung problems.



Medical Questionnaire

The first step is a confidential medical questionnaire.

A healthcare provider decides if you need a medical exam.

Results are only used to determine if you are fit to wear a respirator.

We do not see the details or results of the medical exam



Respirators Must Fit Properly

Respirators must fit properly to prevent leaks around the edges.

Fit-testing must be done before first wearing a respirator.

Beards are **not allowed** when wearing a respirator.



Respirator Fit-testing

In fit-testing, you first try on several types and sizes of respirators.

After a comfortable respirator is selected, we conduct the actual fit-test.

The method we use for fit-testing is as follows:

[describe]



Respirator Seal Check



Inhalation check



Exhalation check

How to Clean and Maintain Respirators

Respirators must be cleaned, inspected and maintained regularly.

Cleaning is especially important in dusty areas.

Clean in warm soapy water.

Allow to dry thoroughly before storing or using.



How Should Respirators be Stored

Respirators must be stored in a clean dry place.

Don't store them unprotected in your work area.

The storage location for your respirators is: [state location here]

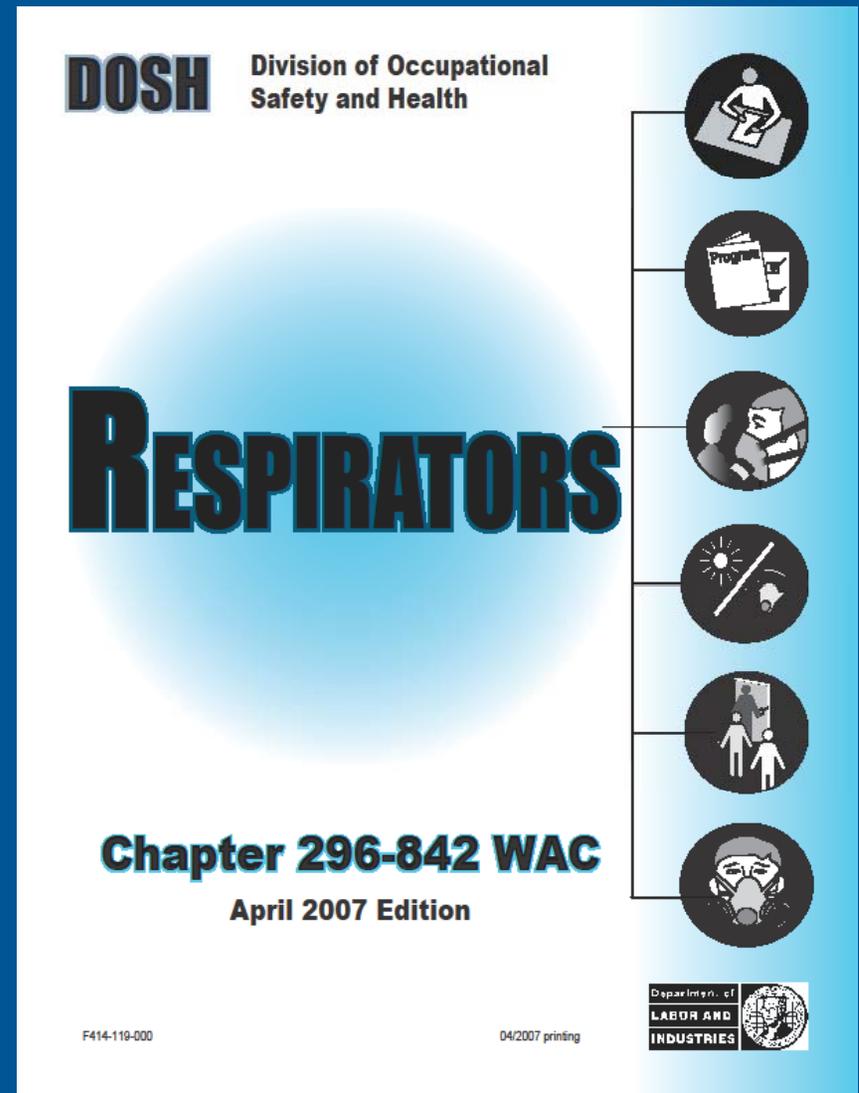


Don't store them like this!

DOSH Regulations

L & I – DOSH has regulations on respirator use.

Everything covered in this training is required in these regulations.



Optional Quiz

The following questions are optional. They can be used to check employees' understanding of this training and promote discussion. You can add more questions for a short written or verbal quiz.

Question 1

What kind of cartridge is needed for ammonia?

- a) A large one
- b) A chemical cartridge
- c) A black one
- d) Any kind will work

Question 2

When should a chemical cartridge be changed?

- a) Every day
- b) When it is hard to breathe through
- c) When you feel like it
- d) On a regular basis depending on the chemical

Question 3

Why can't you wear a respirator over a beard?

- a) The beard will interfere with your breathing
- b) It will cause the respirator to leak
- c) It will cause skin irritation
- d) It will look stupid

Question 4

When is a half-face or full-face respirator not protective enough?

- a) In the case of a large chemical spill
- b) When you have to talk to other employees
- c) When you have to enter a tank
- d) When your eyes burn

Question 5

What does it mean if you smell a chemical while wearing your respirator?

- a) The cartridge is used up
- b) The respirator doesn't fit properly
- c) The exhalation valve is missing
- d) You have a very sensitive nose