

Respiratory Protection

FACT SHEET #19



In our industry, workers are often exposed to airborne or respirable hazards such as smoke, fog, paint, adhesives, welding fumes, dust, or pyrotechnics byproducts. These contaminants can cause serious harm to workers.

WorkSafeBC requires employers to first try elimination, substitution, engineering controls, administrative controls then PPE to reduce worker exposure. Personal Protective Equipment such as respirators should only be used in workplace respiratory protection programs when those other controls aren't practical or when extra protection is needed. Employers must provide workers with respirators at no cost when exposure requires it.

CHOOSING THE RIGHT RESPIRATOR

Not every respirator protects against every hazard. The choice depends on what's in the air. Knowledge of respiratory hazards and respiratory protection is essential to ensure you select the right respirators. If you need consultation for selecting the right respiratory protection, [contact Actsafe](#).

Disposable Respirators



- One-piece unit – Mask + filter are built together, no replacement parts.
- Common type to see for dust, smoke, fog, or biological hazards.
- **Good for** short-term, lower-level exposures.
- **Limitations** – Can't be reused long-term, can't attach vapor cartridges, limited seal/fit.
- Some provide the same level of **particulate** (not vapor) protection as a half-mask respirator with filters; the difference is, they can't be reused or fitted with vapor cartridges.

Half-Mask Respirators



- Reusable facepiece with replaceable filters or cartridges.
- Uses **filter** for particulates and **Cartridges** for vapors
- **Good for** paints, solvents, adhesives, hazardous dusts, welding fumes.
- **Limitations** - Only covers nose/mouth leaving eyes still exposed.

Full-Face Respirators



- Same system as half-mask (replaceable filters/cartridges).
- Adds built-in eye/face protection - important if vapors/chemicals also irritate eyes.
- **Good for** solvents, chemical handling, higher-exposure tasks.
- **Limitations** - Heavier, bulkier, harder to use in tight spaces on small detailed jobs

Surgical masks are not considered respiratory protection.



CLASSIFICATION OF PARTICULATE FILTERS

Filters are rated by two factors:

Series (N, R, P):

- N = Not resistant to oil
- R = Resistant to oil (short-term use)
- P = Oil-proof (best for oily environments)

Efficiency (95, 99, 100):

- 95 = filters 95% of airborne particles
- 99 = filters 99%
- 100 = filters 99.97%

Filter Type	Colour Code	Where You Might Encounter This
N95 / N99 / N100	Magenta (Purple)	Dust from sanding scenery, drywall, wood, smoke/fog effects, and other non-oil-based particulates commonly encountered on film and live-event productions.
R95 / R99 / R100	Magenta (Purple)	Short-term or one-shift (up to 8 hours) exposure to oil-based particulates (e.g., mixed aerosols in industrial or workshop settings). Not recommended for repeated oil exposure.
P95 / P99 / P100	Magenta (Purple)	Hazardous particulates where oil aerosols may be present , such as silica dust from cutting concrete/stone props or mixed particulate environments.
P100 (HEPA)	Magenta (Purple)	High-risk particulate exposures , including asbestos, lead-based paint removal , crystalline silica, and fine particulate or combustion residues. Commonly required for regulated tasks and higher exposure levels.

CLASSIFICATION OF VAPOR CARTRIDGES

Contamination	Cartridge Colour	Where You Might Encounter
Acid gases	White	Cleaners/disinfectants, or chemicals used in construction
Organic vapors	Black	Paints, adhesives, solvents, varnishes, prop coatings, cleaning products. Very common in industry painting, props, and scenic departments.
Ammonia & Methylamine	Green	Less common but possible. Certain cleaning products, chemical reactions for special effects.
Acid gases & organic vapors (combination)	Yellow	Spray painting, working with adhesives/solvents in poorly ventilated areas, or combined exposure from pyrotechnics and paints.
Multi-contaminant / CBRN	Olive	Rare in industry — emergency preparedness for hazardous spills.
Mercury vapor, chlorine, sulfur dioxide	Orange	Rare, but possible if working with old lighting equipment (mercury bulbs), special effects chemicals, or pool chemicals on location.
Particulates	Purple (Magenta)	Very common. Dust from sanding, wood cutting, construction, smoke/fog particulates, fake snow, pyrotechnic residue.



Protection Factors

Protection Factors show **how much a respirator can safely reduce exposure** to airborne hazards when it's used properly.

They're used when **selecting the right respirator** for the job. The higher the number, the more protection it gives.

To know which Protection Factor you need, the **air must be tested or assessed** this is usually by a

supervisor, safety representative, or hygienist; to find out how much contaminant is in the air.

If levels are high, you'll need a respirator with a **higher Protection Factor**.

Protection Factors are set by **WorkSafeBC and NIOSH** for each type of respirator

Respirator type	Protection Factor
Air purifying	
Half facepiece, non-powered	10
Full facepiece, non-powered	50
Full facepiece, powered (PAPR), equipped with HEPA filters for exposure to asbestos	100
Full facepiece, powered (PAPR), equipped with HEPA filters and/or sorbent cartridge or canister for exposure to contaminants other than asbestos	1 000

Other Respirator Types (Rare use)

- **PAPRs (Powered Air-Purifying Respirators):** Battery-powered units that reduce breathing effort, use the same cartridges.
- **Supplied-Air & SCBA:** Deliver clean air from a tank or airline. Required for oxygen-deficient or highly toxic atmospheres.

HOW TO KNOW WHICH FILTER/CARTRIDGE TO USE

Check the Safety Data Sheet (SDS):

- Look at Section 8: "Exposure Controls / Personal Protection."
- It will list the recommended type of respirator and/or filter

Match the hazard:

- Use the charts above to determine the type and level of protection needed for the job task

- Dusts, smoke, fog = N95, P100 filters
- Paints, adhesives, solvents = Organic Vapor (black) cartridge
- Both dust + organic vapors = Combo cartridge (OV/P100)

Confirm manufacturer compatibility:

- Filters and cartridges must match or be compatible with the brand and model of the respirator.

IS YOUR RESPIRATOR READY?

Fit Testing

- Employers must ensure workers are fit-tested yearly or when there are changes to the workers' physical condition.
- Workers must do a seal check every time the respirator is worn.

Replacement

- **Particulate Filters (N, R, and P series):** Replace when breathing resistance increases, the filter becomes visibly dirty or damaged, or after heavy dust exposure. R-series particulate filters used in environments with oil-based particulates are limited



to one shift (up to 8 hours of use) and must be replaced after that period.

- **Gas and Vapour Cartridges:** Replace according to the employer's established change-out schedule. Do not rely on smell or taste as an indicator of cartridge effectiveness. Some cartridges include an End-of-Service-Life Indicator (ESLI) if present, follow the manufacturer's instructions strictly.

- **Manufacturer Information:** Packaging and manufacturer guidance may provide general information; however, actual service life depends on factors such as contaminant type and concentration, humidity, temperature, and the wearer's breathing rate.

QUICK PRE-USE CHECKLIST

- **Inspect:** Straps, seals, valves, cartridges – no cracks or dirt.
- **Seal Check:**
 - **Negative-Pressure Test**
 - Cover the filter/cartridge inlets with your hands.
 - Inhale gently and hold your breath for a few seconds.
 - The facepiece should collapse slightly and stay collapsed while you hold your breath.
 - If air leaks in around the seal, readjust the straps and try again.
 - **Positive-Pressure Test**
 - Cover the exhalation valve with your hand.
 - Exhale gently.
 - The facepiece should bulge slightly without air leaking out.
 - If you feel air escaping, reposition the mask and repeat the test.
- **Fit:** Ensure hair, glasses, costume pieces or other PPE don't interfere.
- **Confirm Cartridges:** Right type, not expired, not overused.

If your respirator fails any check, **do not use it** until it's cleaned, repaired, or replaced.

REGULATORY REFERENCES

For more information on requirements, see the following:

- [Section 8.32-8.45 – Respirators](#)

RELATED RESOURCES

- [Respiratory Protection 101: Respirators, cartridges and filters](#) (Leavitt Safety Blog)
- [Breathe Safer: How to Use Respirators Safely and Start a Respirator Program](#) (WorkSafeBC)
- [Healthcare Respiratory Protection](#) (NIOSH)
- [Personal Protective Equipment](#) (CCOHS)

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