

## RESPIRATORS (AIR-PURIFYING) SWP-012

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### 1.0 Purpose

- 1.1 To provide guidelines for the proper selection, use, limitations and care of air-purifying respiratory (APR) PPE.
- 1.2 This SWP does not address 'filtering face piece' (dust mask) type respiratory protection.
- 1.3 This SWP does not address supplied-air respirators.

### 2.0 Description

- 2.1 An APR is a protective device that covers a worker's nose and mouth; sometimes the entire face; to keep airborne contaminants out of the worker's respiratory system, and help provide a safe air supply.
- 2.2 Respiratory hazards can include airborne contaminants such as: biological contaminants, dusts, mists, vapours, and gases.

**Note** - more than one respiratory hazard can be present at the same time.

- 2.3 APRs, when properly selected and fitted, can significantly reduce the contaminants in the air that you breathe by filtering out particulates (e.g., dusts, vapours, mists, etc.). APRs are tight-fitting and are available in several forms (see Appendix A – Types of APRs):
  - quarter-mask (covering the nose and mouth),
  - half-face mask (covering the face from the nose to below the chin), or
  - full face piece (covering the face from above the eyes to below the chin).
- 2.4 APRs with a full face piece also provide some eye protection.
- 2.5 APRs do not provide protection:
  - for exposed areas of the body (eyes, skin);
  - against contaminants that can irritate/burn the eyes or the skin;
  - contaminants that can be absorbed by the body through the skin; or,
  - in an oxygen deficient atmosphere.

### 3.0 Guidelines

- 3.1 Workers must be trained to select, use, inspect, and maintain APRs.
- 3.2 Use APRs in accordance with manufacturer's instructions.
- 3.3 Use APRs when:
  - other hazard controls are not practical or possible;
  - when identified as required PPE in a MSDS/SDS;
  - when identified as required PPE on a JSA/Tailboard; and,
  - when identified as required PPE in a safe work practice/procedure.

- 3.4 Before using an APR:
- identify the respiratory hazard;
  - evaluate the hazard; and
  - consider other hazard control options (elimination, substitution, engineering or administrative).
- 3.5 Ensure that the APR and filters/cartridges are adequate for the work.
- 3.6 Inspect APR before and after use.
- 3.7 Perform a 'seal check' prior to each use (see section 5.0).
- 3.8 DO NOT use an APR when:
- contaminant concentration has the potential to be '*Immediately Dangerous to Life and Health*' (IDLH);
  - contaminant concentration exceeds the APR 'maximum use concentration';
  - contaminant concentration is at or above 20% of the lower explosive limit (LEL)<sup>1</sup>; and,
  - atmosphere is oxygen deficient; <19.5%.
- 3.9 Immediately leave the contaminated area if:
- breathing becomes difficult;
  - dizziness or other distress occurs;
  - you can smell, taste or sense irritation from the contaminants;
  - (If the APR is equipped) the '*End-of-Service-Life*' indicator has changed color to indicate expiration, or
  - the APR becomes damaged.
- 3.9 Review product MSDS/SDS for health effects and exposure limits.
- 3.10 The service life of an APR will vary depending on the work environment.
- 3.11 ALWAYS ensure there is access to a nearby area that has clean, respirable air.

#### **4.0 Putting on the APR**

##### **Notes –**

1. Different manufacturers APRs may fit differently on your face.
  2. Refer to manufacturer's instructions.
  3. See Appendix B – Putting on a half-mask APR.
- 4.1 Position the straps correctly; one above the ears; the other below the ears and around the neck.
- 4.2 Adjust the straps.
- 4.3 If there is a metal nose piece, mould it around your nose to obtain a good seal.
- 4.4 To take off the respirator:
- Go to an area with clean respirable air;
  - Loosen headbands and remove the face piece.

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<sup>1</sup> Also known as lower flammable limit (LFL).

**5.0 APR seal check**

5.1 The APR should fit tightly, but should not be uncomfortable; or, leave red marks on your face.

5.2 Do not use an APR when conditions prevent a good seal between the face piece seal and the face.

Examples of such conditions are:

- Facial hair (beards, mustaches) or sideburns which will pass between the seal and the face;
- Eyewear, goggles, or other devices which interfere with the APR seal;
- Head or face coverings that will pass between the seal and the face;
- Facial deformities (missing teeth or dentures), deep scars, and skin conditions that may prevent a good seal.

5.3 Perform a seal check:

- Each time the APR is put on;
- Anytime the APR has been adjusted while on the face; and,
- Periodically while working in the contaminated area.

5.4 Pressure testing–

5.4.1 Negative pressure seal check –

- Negative air pressure inside the APR is created by inhaling.
- Close off the inlet opening of the cartridge(s) by covering them with your hands.
- Inhale gently to create a vacuum and hold for 10 seconds.
- If there is a good seal, the face piece will collapse and stay collapsed.
- If the face piece does not collapse and stay collapsed, there is an air leak.
- Reposition the APR, adjust the straps, and repeat the test.

5.4.2 Positive pressure seal check –

- Positive air pressure inside the APR is created by exhaling.
- Close off the exhalation valve by covering them with your hands.
- Exhale gently to create force air into the face piece and hold for 10 seconds.
- If there is a good seal, the face piece will bulge and stay out.
- If the face piece does not bulge and stay out, there is an air leak.
- Reposition the APR, adjust the straps, and repeat the test.

5.5 Testing the Seal

To make sure the face piece maintains a good seal in a variety of positions:

- Move your head up and down;
- Turn head side to side;
- Breathe in and out deeply; and
- Move your jaw to speak.

## 6.0 APR fit test

- 6.1 An APR fit test, either qualitative or quantitative, must be done by a qualified person whenever a worker has been issued a respirator.
- 6.2 Fit testing and associated training must be refreshed every 2 years.

## 7.0 Choosing a filter/cartridge

- 7.1 Ensure you are using the correct filter/cartridge for the contaminants encountered.
- 7.2 The main filter/cartridge categories are:
  - N series (**N**ot resistant to oil) - May be used in any atmosphere where there is NO OIL particulate.
  - R series (**R**esistant to oil) - May be used in any atmosphere where there is NO OIL particulate, or up to one shift where there is oil particulate present. "One shift" means eight hours of continuous or intermittent use.
  - P series (**P**roof) - May be used in any atmosphere, including those with oil particulates, for more than one shift.  
If the filter is used in atmospheres with oil particulates, the life of the filter will be determined by the manufacturer.
- 7.3 Check that filters/cartridges are not clogged, full, or saturated as it makes it harder for air to pass through and increase the likelihood of contaminated air entering the mask.
- 7.4 Filters/cartridges must be replaced on a regular basis as recommended by the APR manufacturer.
- 7.5 Oil can break down some filters/cartridges. Know the materials you are working with and select the correct filters/cartridge for the APR.
- 7.6 If the filter/cartridge has 'End-Of-Service-Life' indicators immediately change the filter/cartridge when the colour changes on either of the indicators.
- 7.7 If the filter/cartridge does not have 'End-Of-Service-Life' indicators establish a schedule to change filter/cartridge before the end of their useful service life.

## 8.0 Inspection, maintenance, and storage of APR

- 8.1 Inspection
  - 8.1.1 Visually inspect all components for:
    - Damage or wear; especially rubber parts;
    - Holes in the filter/cartridge;
    - Loss of elasticity;
    - Tears in the straps;
    - Broken or loose connectors and fittings;
    - Missing parts;
    - Cracked or scratched (full) face piece;
    - Residue or dirt in valves; and
    - General cleanliness.
  - 8.1.2 Replace APR (or parts) as required.

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### 8.2 Maintenance

- 8.2.1 Cleaning and disinfecting the APR after each use will prolong the life of the APR.
- 8.2.2 Follow the APR manufacturer's directions for cleaning and disinfecting.
- 8.2.3 After inspection and cleaning, place your respirator in an individual plastic bag.

### 8.3 Storage

- 8.3.1 Store in a clean dry area in the respirator storage bag provided with the face piece.
- 8.3.2 Store respirators where they will be protected from dust, sunlight/UV, heat, cold, moisture, and chemicals.
- 8.3.3 Store APR with the exhalation valve and breathing inlet in a natural, undistorted position.

## 9.0 Reference documents

Toolbox meeting guide – Putting on your respirator (WorkSafe BC).

Personal Protective Equipment (PPE) – Seal checking your elastomeric respirator (WorkSafe BC)

CAN/CSA-Z94.4-11; *Selection, use, and care of respirators* (Standards Council of Canada).

Appendix A – Types of APRs



Quarter-mask APR

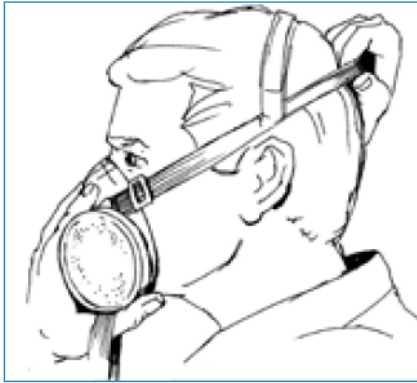


Half-mask APR



Full-face piece APR

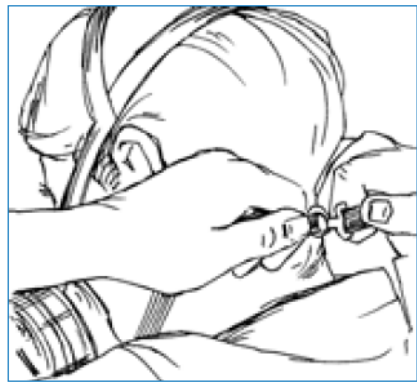
Appendix B – Putting on half-mask APR<sup>2</sup>



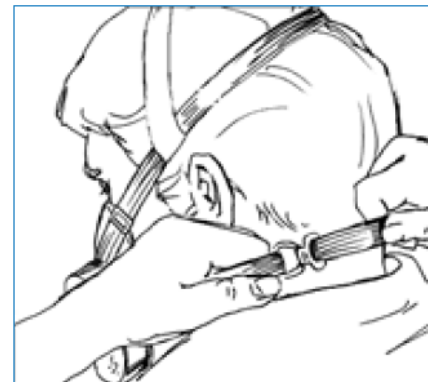
*1. Position head harness*



*2. Grip straps and tighten*



*3. Fasten buckle*



*4. Adjust fit*

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<sup>2</sup> Source – WorkSafe BC; Toolbox meeting guide – Putting on your respirator.