



# Respiratory Protection

## (Part 2)

Fit Testing Protocols, Change-Out Schedule, Maintenance-Care, Record Keeping and Program Evaluation



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## Learning Objectives

- Differentiate between a positive and negative pressure seal-check.
- Compare advantages of the two fit-testing protocols.
- Understand purpose of the cartridge change-out schedule.
- Explain grade-D breathing air quality specifications.



## Select a Respirator

Select a respirator that provides an adequate protection against the airborne chemical exposures.



## **Mask-to-Face Seal**

All respirators that rely on a mask-to-face seal. Check for a good face seal following a series of pressure tests.



## Mask Pressure Test

Appendix B-1 to § 1910.134:

Conduct seal check procedures.

- Pressure test the respirator each time it is worn to assure a tight face seal





# Fit Testing Procedures

Appendix A to § 1910.134 (Mandatory):

Conduct Fit Testing Procedures

- Choose either Quantitative Fit Testing [QTFT] or Quantitative Fit Testing [QNFT]



## Fit Test Exercises

- Normal breathing
- Deep breathing
- Turning head side to side
- Moving head up and down
- Talking
- Grimace (smile or frown)
- Bending over





# Qualitative Testing (QLFT)

## Advantages:

- Inexpensive up-front cost
- Low maintenance

## Disadvantages:

- Imprecise
- Subject to deception
- Limited to fit factor of 100
- No objective results- pass/fail test designation

## QLFT Test Agents & Steps

- Select the agent that the employee can detect the odor or taste
  - Isoamyl acetate,
  - Saccharin and
  - Bitrex®
- Apply the test agent inside the hood or around the mask's face seam if not using a test hood



## Assigned Protection Factors

<ul style="list-style-type: none"><li>• Half mask filtering facepiece dust mask, 2 strap, or a</li><li>• Half mask elastomeric respirator</li></ul>	APF= 10
<ul style="list-style-type: none"><li>• PAPR w/ loose-fitting hood or full mask facepiece</li></ul>	APF= 25
<ul style="list-style-type: none"><li>• Full Facepiece Elastomeric Respirator;</li><li>• PAPR w/ tight-fitting full mask facepiece; or a</li><li>• Supplied-air or a SCBA w/ full facepiece elastomeric mask with a <u>demand mode</u> regulator</li></ul>	APF= 50
<ul style="list-style-type: none"><li>• PAPR w/ tight-fitting helmet or hood or full mask facepiece;</li><li>• Supplied-air or a SCBA w/ full facepiece elastomeric mask or a helmet / hood with a <u>continuous flow</u> regulator</li></ul>	APF= 1000
<ul style="list-style-type: none"><li>• SCBA w/ full facepiece elastomeric mask with a <u>pressure-demand</u> regulator or other positive pressure mode</li></ul>	APF= 2000



# Quantitative Testing (QNFT)

## Advantages

- Precise
- No limit to fit factor limit
- No chance of deception
- Hard copy documentation of results (fit factor)

## Disadvantages

- More expensive
- Requires probed respirator or a sampling adapter

## QNFT Calculating Protection Factor

Protection factors are obtained from quantitative fit testing.

- test chamber = 300 ppm
- inside mask = 3 ppm
- $PF = (300/3) = 100$





## Calculate Cartridge Service Life

- **Respirator cartridges don't last forever!**
- A change-out schedule is the part of the written respirator program. It lists how often the cartridges should be replaced





## Change-Out Schedule Variables

These five variables to calculate the change-out schedule:

1. Chemical look up OSHA's permissible exposure limit
2. Exposure (from air sampling)
3. Metabolic work rate (light-heavy)
4. Air Temperature
5. Relative Humidity



## Check Breathable-Air Quality

- Check breathing air quality periodically
- Ensure the supplied or compressed air meets these five Grade-D breathing air specifications:
  1. Oxygen content (v/v) is between 19.5 to 23.5%;
  2. Hydrocarbon (condensed) content of 5 mg/m<sup>3</sup> or less;
  3. Carbon monoxide gas (CO) content 10 ppm or less;
  4. Carbon dioxide gas content 1,000 ppm or less; and
  5. Lack of noticeable odor





## Maintenance and Care

Inspect respirators for basic function prior to each use and cleaned as often as necessary to prevent the occurrence of unsanitary conditions.

Follow procedures specified in § 1910.134 Appendix B-2 of this standard.





## Cleaning and Storage

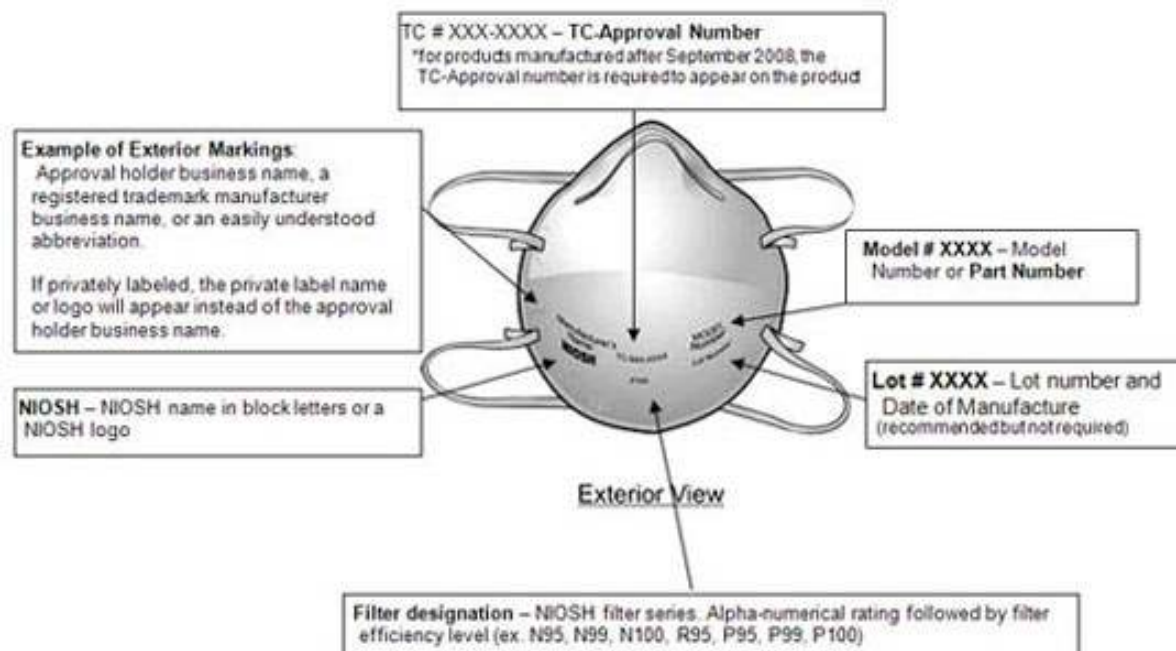
- Must be cleaned regularly
- Respirator should be cleaned and disinfected if used by more than one person
- Disassemble the respirator soak in warm water and with clean water
- Air dry all parts of the respirator or wipe dry with a clean lint-free cloth



## Record Keeping

- Keep a written copy of your program and the OSHA standard and make available to all employees who wish to review it
- Keep the following records:
  - Training records
  - Medical clearance records
  - Qualitative & quantitative fit test records

# Filtering Face Piece Respirators





# Voluntarily Wearing Disposable Respirators

Appendix D to § 1910.134:

Information for employees, who voluntarily wear disposable filtering face piece respirators:

- Read and heed the manufacturer's instructions and warnings regarding the respirators limitations
- Do not wear their respirator into atmospheres containing contaminants that the respirator is not designed to protect against



## Program Evaluation

- Program Administrator should conduct periodic evaluations to ensure that the provisions of the program are being implemented.
- Update the written program to account for workplace changes
- Corrects any problems identified

**Questions?**