



## SAFETY TOOLBOX TRAINING - RESPIRATORY PROTECTION

### SUPERVISOR INSTRUCTIONS:

- Use toolbox trainings to spark safety discussions during monthly meetings with employees.
- Fax a copy of the employee sign-in sheet to Tiffany Dothard with EHSO at 404-727-5904 as a record of employee attendance.

### When are Respirators Required?

The tasks of your job may expose you to a number of respiratory hazards that require you to wear a respirator. Processes using high temperatures, such as welding, produce smoke and fumes when metals are heated; spray painting generates mists; cutting and sanding wood generates dusts; and confined spaces may have an oxygen deficient atmosphere. Selecting the right respirator requires an assessment of all the workplace operations, processes or environments that may create a respiratory hazard. This assessment should be done by the Environmental Health and Safety Office (EHSO) before respirators are issued.

### How do Respirators Work?

Respirators work by either filtering particles from the air, chemically cleaning (purifying) the air, or supplying clean air from an outside source. **Particulate respirators** are the simplest and least expensive of the respirator types available. These respirators only protect against particles (e.g., dust). They do not protect against chemicals, gases, or vapors, and are intended only for low hazard levels. The most common types are the “N-95” filtering face-piece respirator or “dust masks”. There are nine classes of particulate filters which are broken down into three series (N, R, and P). Each series is available at three efficiency levels: 95%, 99%, and 99.97%. The N series filter is used in environments free of oil mists. The R series filters can be exposed to oil mists, but should only be worn for one work shift. The P filter can be exposed to oil mists for longer than one work shift. Particulate respirators:

- Filter out dusts, fumes and mists;
- Are usually disposable dust masks or respirators with disposable filters;
- Must be replaced when they become discolored, damaged, or clogged;
- Examples: filtering face-piece or elastomeric respirator.



**Chemical cartridge respirators** purify or clean chemicals out of the air as you breathe. These respirators include a face-piece or mask, and a cartridge or canister, which may also have a filter to remove particles. Chemical cartridge respirators are effective only if used with the correct cartridge or filter for a particular substance. There are cartridges available that protect against more than one hazard, but there is no “all-in-one” cartridge that protects against all substances. Therefore, it is important to know what hazards you will face in order to be certain you are choosing the right filters/cartridges. Chemical cartridge respirators:

- Use replaceable chemical cartridges or canisters to remove the contaminant;
- Are color-coded to help you select the right one;
- May require multiple cartridges to protect against multiple hazards.



**Powered air-purifying respirators** use a fan to draw air through the filter to the user. They are easier to breathe through; however, they need a fully charged battery to work properly. They use the same type of filters/cartridges as other air-purifying respirators. It is important to know what the hazard is, and how much of it is in the air, in order to select the proper filters/cartridges.

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**Self-Contained Breathing Apparatus (SCBA)** is the respirator commonly used by firefighters. These use their own air tank to supply clean air, so you don't need to worry about filters. They also protect against higher concentrations of dangerous chemicals. However, they are very heavy (30 pounds or more), and require special training on how to use and to maintain them. Also, the air tanks typically last an hour or less depending upon their rating and your breathing rate.

### What is the Color Coding for Chemical Cartridges/Canisters?

All cartridges are assigned a color designating the type of contaminant they filter. The table below is a guide to cartridge color coding:



CONTAMINANT	COLOR CODING ON CARTRIDGE/CANISTER
Acid gases	White
Hydrocyanic acid gas	White with 1/2 inch green stripe completely around the canister near the bottom.
Chlorine gas	White with 1/2 inch yellow stripe completely around the canister near the bottom.
Organic vapors	Black
Ammonia gas	Green
Acid gases and ammonia gas	Green with 1/2 inch white stripe completely around the canister near the bottom.
Carbon monoxide	Blue
Acid gases & organic vapors	Yellow
Hydrocyanic acid gas and chloropicrin vapor	Yellow with 1/2 inch blue stripe completely around the canister near the bottom.
Acid gases, organic vapors, and ammonia gases	Brown
Radioactive materials, except tritium (H-3) and noble gases	Magenta
Pesticides	Organic vapor canister plus a particulate filter
Multi-Contaminant and CBRN agent	Olive
Any particulates - P100	Purple
Any particulates - P95, P99, R95, R99, R100	Orange
Any particulates free of oil - N95, N99, or N100	Teal

### What are the Requirements for Wearing a Respirator?

Breathing through a respirator is more difficult than breathing in open air. People with lung diseases, such as asthma or emphysema, may have trouble breathing. Therefore, anyone required to wear a negative pressure respirator must be medically evaluated by Employee Health Services (EHS) annually. Once cleared by EHS to wear a negative pressure respirator, training and fit testing are conducted by the Environmental Health and Safety Office (EHSO). Training is important in regard to the storage, maintenance, use, and disposal of the respirator. Negative pressure respirators (tight fitting respirators) require fit testing to ensure an adequate fit to the face and cannot be used with facial hair. Anything that prevents the face-piece from fitting tightly against your face, such as a beard or long sideburns, may cause leakage. Therefore, if your respirator requires a tight fit, you must trim back your beard so that it will not interfere with the seal. Also, respirators must be checked for proper fit each

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time they are donned to ensure they provide adequate protection. The table below shows how to conduct fit checks each and every time you don a respirator.

POSITIVE FIT CHECK	NEGATIVE FIT CHECK
<ul style="list-style-type: none"><li>• Cover the exhalation valve with the palm of your hand;</li><li>• Exhale into the face-piece;</li><li>• If you have a good seal positive pressure will build up in the face-piece causing the mask to slightly lift off of your face</li></ul> 	<ul style="list-style-type: none"><li>• Cover the inlet openings with the palms of your hands;</li><li>• Inhale gently;</li><li>• If you have a good seal, the face-piece will collapse</li></ul> 

### When Do I Change My Respirator Cartridges?

Respirators reduce exposure to the hazard, but if the exposure is such that it goes beyond what the filter/cartridge is capable of handling the filter/cartridge will not be effective in providing the required protection. Also, cartridges, filters, and respirators get old and over time may deteriorate. If the cartridges are outdated, have been open to the air or are damaged, you may not be protected. Cartridges that contain charcoal or other chemicals for filtering the air should be kept in air-tight packages until use. Even cartridges in original packaging have expiration dates that should be checked before purchase and use. There is no absolute time limit for respirator filters and cartridges, and it will vary by each respirator model's capacities and the concentration of the hazard. However, if you begin smelling a chemical that the respirator should be protecting you from or it becomes difficult to breathe, leave the hazardous environment and replace the filter/cartridges. This is a sign that the respirator is not doing its job!

### Will a Chemical Cartridge Respirator Protect Me in an Oxygen Deficient Atmosphere?

No. Neither particle filtering face-pieces nor chemical cartridge respirators protect against oxygen deficiency because they do not provide oxygen. If these respirators are used in an environment with low oxygen levels, such as in a fire or a confined space, you are in danger of asphyxiation.

For every type of respirator that we use, choice and use is extremely important. It's also important that you be fit tested for the type of respirator you use. If you have any questions concerning the use of any respirator, please contact EHSO at 404-727-5688.

### QUESTIONS TO CONSIDER:

1. Has a workplace assessment been conducted for the task you are performing to determine if a respirator is needed or the type of respirator needed?
2. Have you been medically cleared by Employee Health Services to wear a respirator within the past year?
3. Have you attended the Respiratory Protection Training and Fit Testing conducted by the EHSO within the past year?
4. Do you know how to conduct fit checks every time you don a respirator?
5. Are there any special maintenance or storage conditions for your respirator?