

## Appendix A

### **RESPIRATOR SELECTION GUIDELINES**

The following information provides only a brief summary of the respirator selection process, and is included in this appendix for educational purposes. For more information, follow the web links included at the end of this appendix or contact the EH&S Respiratory Protection Program Manager at 352-392-1591.

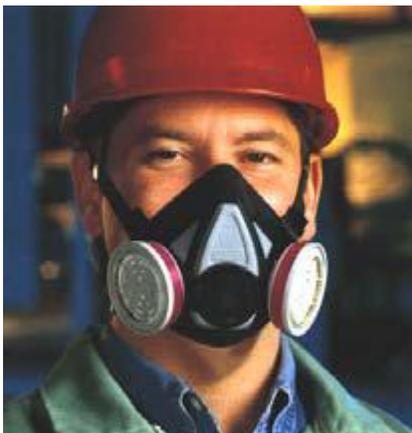
The first step in selecting the appropriate respirator is to identify the activity or process the individual will be engaged in. The concentration of the air-borne contaminant should be determined either through exposure assessments using air sampling methods or by making a reasonable estimate of the concentration encountered in the work area. These results are then compared to established "safe levels of exposure" using published exposure limits and guidelines.

Additional steps in the process include:

- Assessing the respirator's assigned protection factors,
- The time the wearer will spend using the respirator,
- Researching existing standards for a chemical that may require a specific type of respiratory protection,
- The atmosphere the respirator will be used in (e.g. oxygen deficient) and
- The physical and filtering limitations of the respirator.

Respirators can be tight fitting or loose fitting as outlined below.

#### **Tight Fitting Coverings**



Half Mask Respirator



Full Facepiece Respirator

## Loose Fitting Coverings



Hood Type 1



Hood Type 2

Respirators can be further categorized into two groups, air purifying and air supplied.

### Air Purifying Respirators

These respirators remove air contaminants as they pass through the respirator filter. This respirator is to be used only where adequate oxygen (19.5 to 23.5 by volume) is present. Air purifying respirators are subdivided into the following types:

1. Particulate Removing Respirators: These respirators use a filtering device that physically filters out dusts, fibers, fumes and mists. These respirators may be single-use disposable filtering facepiece or dust mask respirators or respirators with replaceable filters. The current filter classification system is broken into two categories that designate the filter efficiency and the filters ability to work in environments containing oil particulate.

#### Classes of Filters

- There are nine classes of filters (three levels of efficiency, each with three categories of resistance to filter efficiency degradation)
- Levels of filter efficiency are 95%, 99% and 99.97% (100%)
- Categories of oil resistance are N (no oil), R (resistant to oil) and P (oil proof)
- Filter designations are presented on the following table

Filter Efficiency	N (Non-oil Environments)	R (Oil Resistant)	P (Oil Proof)
95%	N95	R95	P95
99%	N99	R99	P99
99.97%	N100	R100	P100

## Types of Particulate Removing Respirators

### Filtering Facepiece (Dust Mask)

A negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium



### Powered Air-Purifying Respirator (PAPR)

An air-purifying respirator that uses a blower to force the ambient air through the air-purifying elements to the inlet covering



Respiratory Protection for Tuberculosis and Other Infectious Diseases  
Current CDC guidelines allow the use of all nine classes of loose fitting facepiece respirators. The N95 filtering facepiece is most commonly used.

PAPR's used for protection against infectious diseases must be equipped with HEPA filters.

Respirator users should check the CDC website for any updates or changes to respirator use guidelines for infectious disease control.

**NOTE:** Surgical masks are not considered respirators and do not provide adequate protection from air contaminants. They are never to be used in place of an air-purifying respirator.

2. Gas and Vapor Removing Respirators: These respirators remove specific individual contaminants or a combination of contaminants by absorption, adsorption or by chemical reaction. Gas masks and chemical cartridge respirators are examples in this group. Combination respirators that remove both particulate and gas/vapor are available. The gas/vapor cartridges are typically identified by color coding. Typical color codes are presented on the following chart.

Contaminant	Cartridge Color Code
Acid Gases	White
Organic Vapors	Black
Ammonia Gas	Green
Acid Gas and Organic Vapor	Yellow
HEPA or P100	Magenta (Purple)

All filters, cartridges and canisters used in the workplace must be labeled and color coded with the NIOSH approval label.

This label must not be removed and must remain legible.



**NOTE:** Where eye irritation is possible, a full facepiece respirator is required.

### **Air Supplied Respirators**

These respirators provide breathing air independent of the environment. Such respirators are to be used when the contaminant has insufficient odor, taste or irritating warning properties or when the contaminant is of such high concentration or toxicity that an air-purifying respirator is not adequate. The most common type of air supplied respirator is the self contained breathing apparatus (SCBA). While this type of unit offers the greatest degree of protection, it is also the most complex.

Training and practice in its use and maintenance is essential and it is to be used only in emergency situations.

In addition, all work locations where there are atmospheres that are categorized as Immediately Dangerous to Life or Health (IDLH) require the use of a full facepiece, positive pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes or a combination full facepiece pressure demand supplied air respirator (SAR) with an auxiliary self contained air supply  
All oxygen deficient atmospheres (<19.5% O<sub>2</sub> by volume) shall be considered IDLH.

For additional information regarding the selection and use of respirators, please consult the following links.

1. CDC Interim Recommendations for the Selection and Use of Protective Clothing and Respirators Against Biological Agents  
<http://www.bt.cdc.gov/documentsapp/Anthrax/Protective/10242001Protective.pdf>
2. NIOSH Guide to the Selection and Use of Particulate Respirators Certified Under 42 CFR 84 DHHS Pub. No. 96-101  
<http://www.cdc.gov/niosh/userguid.html>
3. Respiratory Protection Program in Health Care Facilities Administrator's Guide U.S. DHHS, CDC  
<http://www.cdc.gov/niosh/docs/99-143/>
4. Respirator Change Schedules, Occupational Safety and Health Administration (OSHA)  
[http://www.osha.gov/SLTC/etools/respiratory/change\\_schedule.html](http://www.osha.gov/SLTC/etools/respiratory/change_schedule.html)
5. Respiratory Protection Topic Page, OSHA  
<http://www.osha.gov/SLTC/respiratoryprotection/index.html>
6. 3M Safety Products, Respiratory Protection Page  
[http://solutions.3m.com/wps/portal/3M/en\\_US/Health/Safety/Products/Catalog/?PC\\_7\\_RJH9U5230GE3E02LES9MG812H2\\_nid=8G2B3GV59PbeF3RH7CD92NgI](http://solutions.3m.com/wps/portal/3M/en_US/Health/Safety/Products/Catalog/?PC_7_RJH9U5230GE3E02LES9MG812H2_nid=8G2B3GV59PbeF3RH7CD92NgI)
7. Interim Guidance for Infection Control for Care of Patients with Confirmed or Suspected Swine Influenza A (H1N1) Virus Infection in a Healthcare Setting, CDC  
[http://www.cdc.gov/h1n1flu/guidelines\\_infection\\_control.htm](http://www.cdc.gov/h1n1flu/guidelines_infection_control.htm)