

APPENDIX A

RESPIRATOR SELECTION

A-1. The FOA Safety and Occupational Health Office is responsible for advising supervisors on the type of respirator required. In selecting a respirator, Safety/Health and supervisory personnel should assemble the information needed by answering the following questions:

a. What is the measured or estimated contaminant concentration at the breathing zone of the worker?

b. What is the Permissible Exposure Limit (PEL) and/or Threshold Limit Value (TLV) of the contaminant? (Use more stringent of the two.)

c. Is the workspace oxygen deficient (less than 19.5% oxygen)?

d. What is the lower explosive limit (LEL) of the contaminant?

e. Does an IDLH situation exist at contaminant concentration?

f. If gas or vapor --

(1) Is efficient sorbent available?

(2) Does contaminant have adequate warning properties?

g. Will eye irritation occur at contaminant concentration?

h. Will skin absorption pose a problem?

i. Are there other circumstances/conditions which should be considered?

A-2. Using the above information and Tables A-1 - A-3, select the proper type of respirator and facepiece. Sections of these tables have been extracted from OSHA Instructions 2-20.20 CH-4, 2 MAR 82; and CPL 2-20.20 CH-4, 4 JUN 82, the original sources being "ANSI STANDARDS" and "Respirator Protection Factors" E. Hyatt, Los Alamos Scientific Laboratory Publication LA - 6084 - MS, Jan 76.

TABLE A-1  
RESPIRATOR SELECTION GUIDE

| HAZARD  | TYPE RESPIRATOR   |
|---|---|
| <u>GASES OR VAPORS</u>                            |   |
| Oxygen Deficiency                                 | Self-contained breathing apparatus, positive pressure mode.<br>Combination air-line respirator with auxiliary positive pressure self-contained air supply.      |
| Immediately dangerous to life or health (IDLH)    | Self-contained breathing apparatus in positive pressure mode.<br>Combination air-line respirator with auxiliary positive pressure self-contained air supply.    |
| Not immediately dangerous to life or health       | Air-line respirator.<br>Air-purifying, half-mask or full facepiece respirator with chemical cartridges or canister.   |
| <u>PARTICULATES</u>                               |   |
| Immediately dangerous life or health (IDLH)       | Self-contained breathing apparatus in to positive pressure mode.<br>Combination air-line respirator with auxiliary positive pressure self-contained air supply. |
| Not immediately dangerous to life or health       | Air-line respirator.<br>Air-purifying, half-mask or full facepiece respirator with filters (pads or cartridges).<br>Air-line abrasive-blasting helmet.          |
| <u>COMBINATION GASES, VAPORS AND PARTICULATES</u> |   |
| Immediately dangerous life or health (IDLH)       | Self-contained breathing apparatus in to positive pressure mode.<br>Combination air-line respirator with auxiliary positive pressure self-contained air supply. |
| Not immediately dangerous to life or health       | Air-line respirator.<br>Air-purifying, half-mask or full facepiece respirator with chemical cartridges or canister and appropriate filters.                     |

TABLE A-2  
PROTECTION FACTORS FOR  
PARTICULATE FILTER RESPIRATORS

| Concentration in multiples of the PEL or TLV                 | Facepiece Pressure | Permissible Respirators   |
|--|--------------------|---|
| 5 X  | -                  | Single use dust   |
| 10 X   | -                  | Half-mask dust  |
|  | -                  | Half-or quarter mask, fume  |
|  | -                  | Half-or quarter mask, high efficiency   |
|  | -                  | Half-mask supplied air  |
| 50 X   | -                  | Full facepiece, high-efficiency   |
|  | -                  | Full facepiece, supplied air  |
|  | -                  | Self-contained breathing apparatus (SCBA)   |
| 1,000 X  | +                  | Powered, high-efficiency, all enclosures  |
|  | +                  | Half-mask, supplied air, Type C positive pressure, demand mode                                |
| 2,000 X  | +                  | Supplied air with full facepiece, hood, helmet or suit, Type C positive pressure, demand mode |
| 10,000 X   | +                  | Full facepiece, SCBA  |
|  | +                  | Full facepiece supplied air and auxiliary self-contained air supply                           |
| Fire fighting or emergency entry into unknown concentrations | +                  | Full facepiece SCBA   |
| Escape only  | +                  | Any SCBA  |
|  | +                  | Any self rescuer  |

1/ In an atmosphere which is immediately dangerous to life or health.

- Notes: 1. Half-mask and quarter-mask respirators should not be used if the particulate matter causes eye irritation at the use concentrations.
2. Full facepiece supplied-air respirators should not be used in any atmosphere which is immediately dangerous to life or health unless it is equipped with an auxiliary air supply which can be operated in the positive pressure.

TABLE A-3

PROTECTION FACTORS FOR  
GAS OR VAPOR RESPIRATORS

| Concentrations in multiples of the PEL or TLV                | Facepiece Pressure | Permissible Respirators   |
|--|--------------------|---|
| 10 X   | -                  | Half-mask chemical cartridge respirator with "Name" cartridges, or canister half mask, supplied-air |
| 50 X   | -                  | Full facepiece gas mask or chemical cartridge with "Name" cartridges or canister.                   |
|  | -                  | Full facepiece SCBA<br>Full facepiece supplied-air  |
| 1,000 X  | +                  | Half-mask supplied-air  |
| 2,000 X  | +                  | Supplied-air with full facepiece, hood, helmet or suit  |
| 10,000 X   | +                  | Full facepiece, SCBA  |
|  | +                  | Full facepiece supplied air with auxiliary self-contained air supply                                |
| Fire fighting or emergency entry into unknown concentrations | +                  | full facepiece SCBA   |
| Escape only <u>1</u> /                                       | +                  | Any full facepiece SCBA   |
|  | +                  | Any self-rescuer  |

1/ In an atmosphere which is immediately dangerous to life or health.

- NOTES: 1. The "Name" means approved chemical canisters or cartridges against a specific contaminant or a combination of contaminants such as organic vapor, acid gases, organic vapor plus particulates or acid gases plus organic vapor.
2. Quarter or half-mask respirators should not be used if eye irritation occurs at the use concentration.
3. Full facepiece supplied air respirators should not be used in any atmosphere which is immediately dangerous to life or health unless it is equipped with an auxiliary air tank which can be operated in the positive pressure mode.
4. Air purifying respirators cannot be used for contaminants having inadequate warning properties.