Respirator Selection

Respiratory protection must be worn whenever you are working in a hazardous atmosphere. The appropriate respirator will depend on the contaminant(s) to which you are exposed, and the assigned protection factor (APF) required. Required respirators must be NIOSH-approved, and medical evaluation, training, and fit testing must occur before use.

These general guidelines are to be used by Environmental Health and Safety (EHS) and respirator users in selecting an appropriate respirator for the hazard. Types of respirators include:

- **Air-purifying respirators**, which remove or neutralize contaminants (particulate or gas/vapor) from an otherwise-breathable atmosphere, and
- **Atmosphere-supplying respirators**, which supply breathable air.

Assigned Protection Factors (APFs) are the level of protection a properly functioning respirator would be expected to provide to a population of properly fitted and trained users (e.g., an APF of 10 means a user could expect to inhale no more than one-tenth of the airborne contaminant present). Use the APFs listed in **Table 1** to select a respirator that meets or exceeds the required level of employee protection. When using a combination respirator (e.g., airline respirators with an air-purifying filter), ensure the APF is appropriate to the mode of operation in which the respirator is being used.

Table 1 – Respirator Selection

Respirator Type	Example	Description	APF
Dust mask (non-NIOSH approved)		• Loose-fitting mask for single use only. • Flexible pad held over the nose and mouth by an elastic or rubber strap to protect against dust encountered during construction or cleaning activities (e.g., dust from drywall, brick, wood, or sweeping). • Cannot protect against hazardous atmospheres. • *Non-NIOSH-approved; disposable dust masks are not approved for use at Northwestern.*	N/A
Particulate respirator/ filtering facepiece (NIOSH-approved) (e.g., N-95, N-99, P-100)		• Negative-pressure particulate respirator (i.e., a respirator that needs a tight seal between the respirator and face and/or neck of the user in order to work properly that has negative air pressure with respect to the ambient air outside the respirator during inhalation) with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium. • Captures particles in the air (e.g., dust, mists, and fumes), but does not protect against gases or vapors. • Should be disposed of and replaced with a new one each time they are removed. • Medical clearance and fit testing are not required for voluntary use.	5

Respirator Type	Example	Description	APF
Half-Face Mask Air-Purifying Respirator (APR)		• Tight-fitting, air-purifying filtration respirator that does not provide eye or face protection. • Can be used with particulate filters. • Can be used with gas/vapor canisters. • Only protects against the specific contaminants that the filter or canister is designed for. • Provides protection only as long as the filter's or canister's absorbing capacity is not depleted. • The service life of the filter or canister depends upon many factors and can be estimated in various ways. • Can be used with combination particulate filter/gas canisters.	10
Full-Facepiece Air-Purifying Respirator (APR)		• Tight-fitting, air-purifying filtration respirator that provides eye and face protection from irritants and contaminants when properly fitted and sealed. • Can be used with particulate filters. • Can be used with gas/vapor canisters. • Only protects against the specific contaminants that the filter or canister is designed for. • Provides protection only as long as the filter's or canister's absorbing capacity is not depleted. • The service life of the filter or canister depends upon many factors and can be estimated in various ways. • Can be used with combination particulate filter/gas canisters.	50
Powered Air Purifying Respirator (PAPR)		• Air-purifying respirator that uses a battery-powered blower to force ambient air through the air-purifying elements to the inlet covering and then pushes the filtered air into the facepiece, which covers all of the user's face. • PAPRs come in a variety of types including loose-fitting facepiece, half-face mask, full facepiece, and helmet/hood. • Loose-fitting facepiece PAPRs do not need to be fit-tested and can be used by most workers with facial hair. • PAPR is a common substitute for users deemed medically unable to wear other types of respirators.	**Loose-fitting facepiece:** 25 **Half-face mask:** 50 **Full-facepiece:** 1,000 **Helmet/hood:** 425/1,000

Respirator Type	Example	Description	APF
Self-contained breathing apparatus (SCBA)		• Provide breathing air independent of the environment. • 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. • While this offers the greatest degree of protection, it is also the most complex; training and practice in its use and maintenance are essential, and it is only for use in emergency situations and oxygen-deficient or Immediately Dangerous to Life or Health (IDLH) atmospheres. • All work locations where there are atmospheres that are categorized as IDLH require the use of a full-facepiece, positive-pressure, demand SCBA certified by NIOSH for a minimum service life of 30 minutes or a combination full-facepiece, pressure-demand, supplied-air respirator (SAR) with an auxiliary self-contained air supply.	**Half-face mask (demand mode):** 10 **Full-facepiece (demand mode):** 50 **Full-facepiece (pressure-demand):** 10,000 **Helmet/hood (demand mode):** 50 **Helmet/hood (pressure-demand):** 10,000
Emergency escape-use breathing apparatus		• Self-contained, compressed air apparatus for escape from a contaminated environment (e.g., 10-minute escape).	N/A

For questions, contact Environmental Health and Safety (EHS) at ehs@northwestern.edu.